

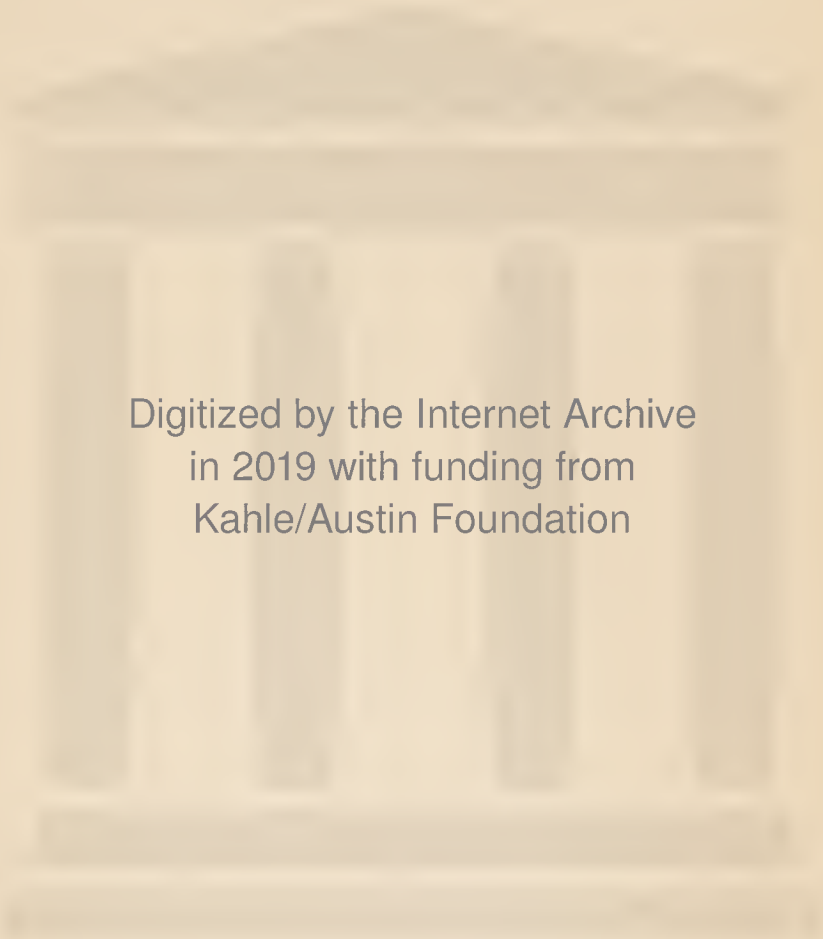
INTRODUCTION TO
CONTEMPORARY
CIVILIZATION

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INTRODUCTION TO
CONTEMPORARY
CIVILIZATION

*AN ORIENTATION COURSE
FOR COLLEGE STUDENTS*

By

WALTER LIBBY, M.A., PH.D.

*Author of "An Introduction to the History of Science" and
"The History of Medicine in its Salient Features."*



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TO THE MEMORY OF
MY MOTHER, MARY F. LIBBY,
AND OF MY SISTER
WHO BORE THE SAME NAME,
THIS BOOK,
WHICH REFLECTS THEIR SPIRIT
AND THEIR INTERESTS,
IS AFFECTIONATELY DEDICATED

PREFACE

As the manuscript of this book nears completion I am reminded of two delightful experiences of my student days, somewhat similar to each other. One afternoon in the summer holidays of 1903 I set out from the picturesque shores of Derwentwater for the top of Skiddaw. The early stages of the ascent led, as I remember, through a wood and along a verdant slope where sheep and cattle were grazing in the sunlight. Higher up, the way became stony and rather precipitous. As I approached the spot which had appeared from the level to be my objective, I found that the real summit was further to the north and west, and that before attaining it I must descend for a considerable distance and take a rougher and more tedious way to the height. At this point a number of tourists, somewhat tired and discouraged, had turned back. After pushing on to what again seemed the best outlook, I discovered that there was still some distance to be covered before the very top was reached. When, however, I finally stood at the highest point of all, my exertions were rewarded by a remarkable prospect. The northwestern counties of England were spread out before me; beyond the Solway Firth rose the mountains of Dumfries and Kirkcudbright; great expanses of the Irish Sea were distinctly visible, and I thought I could descry the outlines of northern Wales, Anglesey, and, on the western horizon, the Isle of Man. It was difficult to believe that the range of vision could be so extended by a few hours' easy walking. The descent, in the evening light, was scarcely less exhilarating. Not only the distant but the nearer view was now seen from a new angle, the base of the mountain richly swathed in purple heather and the little town of Keswick nestling by the miniature lake. About a year later I looked out from Rigikulm on Swiss lakes and hundreds of miles

of radiant Alps, distinguishing in the intricate scene scores of peaks, whitecaps on a sea of mountains.

After having presented the materials of this orientation course to a class of some six hundred freshmen at an institution of higher learning in the United States as well as to a more select group of students in one of the Canadian universities, I am convinced that, through an educational experience roughly comparable to that of a mountain climber, the aspiring youth of the twentieth century (when mechanical devices are doing so much to overcome the obstacles of space and time) should be enabled to transcend the limitations of their special studies and to reach a point of vantage from which to survey, not merely one phase of contemporary life, but a wide range of its interrelated phases. I have, therefore, written this work for college students to give them a synopsis or bird's-eye view of present conditions, to help them find their bearings in the diversified studies of the academic curriculum, to provoke their coöperation in the educational process, and to introduce them to the responsibilities of our complex social life. I have adopted the point of view of the modern scientist in the hope of bringing into perspective all the high places of contemporary civilization. I have passed in rapid review the most important vocational activities, and indicated the relation of these activities to the development of the sciences. In endeavoring to give a comprehensive and harmonious picture, or esthetic presentation, of the life of our times I have avoided mere sketchiness as far as I could. The book furnishes, I trust, sufficient detail to make clear the chief landmarks of contemporary civilization, leaving the task of opening up fresh vistas and of fixing lines and boundaries to those special studies for which this work is a preparation and in no sense a substitute. It is, I must mention in particular, not a history. Though the historical method is frequently employed for the sake of clearness of exposition, the order of topics selected for treatment is logical and not chronological.

The first twelve chapters of the book are mainly concerned with the development of those occupations on which a very large pro-

portion of the people of every civilized country depend for a livelihood. The two opening chapters form a general introduction. The first chapter determines the point of view (namely, the developmental or evolutionary) to be maintained throughout the volume, and culminates in the acceptance of the proposition that human progress involves the improvement of both the inherent qualities (or biological inheritance) and the environmental conditions of the species. The second chapter, by tracing some of the early stages of the division of labor (occupational differentiation), indicates the line along which we are to advance in attacking the problems of contemporary civilization. The next three chapters deal with the improvement of biological inheritance by means of selection. The third chapter describes the natural and artificial selection of plants and animals, thus touching upon one of the most important aspects of contemporary agriculture; the fourth chapter shows the relation of the principle of natural selection to the differentiation of the races of man; and the fifth discusses the problem of eugenics or the application of the principle of artificial selection in the improvement of the human species. The next seven chapters deal with the improvement of material conditions through the development of a number of closely interrelated vocational activities — trade and commerce, the introduction of large-scale (regional and international) division of labor, and the inclusion of the remotest nations and peoples in one great economic organization; war as the result of economic rivalry, the quest for markets, raw materials, and foodstuffs, the control of trade routes, harbors, and access to the sea, conflicting colonial policies, and imperialism; the gradual development of international law as a substitute for the stupidity and brutality of war, the determination of the rights of belligerents and neutrals, the suppression of piracy, the regulation of commerce, the recognition of the economic interdependence of peoples, the formation of an Association of States, and international coöperation in promoting the general welfare of mankind; the development of law and justice in response to social progress, to the growth of industrial enterprise

and occupational differentiation, to the increase of wealth and transportation facilities, to the influx of alien laborers, etc.; the development of medical science and practice as related to the growth of modern industry, to commercial and colonial expansion in the tropics, to the opening up of new trade routes and ports of entry, to the construction of canals and similar improvements; the most important stage in the development of modern manufactures, ushering in momentous changes (in the midst of which we live) and involving such matters as the invention of machinery, the utilization of new sources of power, the increased output of coal and iron, the expansion of the textile trade, the extension of the factory system, the transformation of domestic life, the further division of labor, the lessened importance of agriculture as compared with manufacture, the shifting of population, and the rise of modern capitalism and methods of exchange; finally, the improvement of the highways, the stage-coach, and the waterways, the rise of steam navigation, the invention of the locomotive and the development of railways as related to the growth of mining, metallurgy, and other industries, and the introduction of the electric telegraph as an adjunct of rapid transport.

The great extent to which the daily vocational activities of the people of civilized countries fall within the scope of the first twelve chapters of this book may be inferred from the fact that of the forty-two million persons ten years of age and over employed in gainful occupations in the United States in 1920 no less than 30.8 per cent were engaged in manufacturing and mechanical industries; 26.3 per cent in agriculture, forestry, and animal husbandry; 10.2 per cent in trade; 8.1 per cent in domestic and personal service; 7.5 per cent in clerical occupations; 7.4 per cent in transportation; 5.2 per cent in professional service; 2.6 per cent in the extraction of minerals; and 1.9 per cent in the public service (exclusive of those classified under previous headings).

The last eighteen chapters, still following the clue of the differentiation of the vocations, are concerned in the main with the imponderable elements of contemporary civilization, with the

increased sense of the unity of mankind, with the clarification and application of ethical ideas, and with the development of moral values as, for example, when we choose to follow a social and altruistic instead of an individual and egoistic course of conduct or when we ascend from the lower to the higher forms of loyalty. The thirteenth chapter, which forms a transition from the first part of the book to the second, repudiates the conception that the civilization of today can be gauged solely by reference to some symptom of material welfare, such as transportation, and recognizes the importance of other criteria of progress, such as the development of the intellectual and moral qualities. The fourteenth chapter describes the growth of modern cities as one of the results of the Industrial Revolution, while the fifteenth chapter traces the development of the spirit of democracy, especially in relation to the organization of the artizan and mercantile classes of the urban population. The sixteenth chapter deals with some of the characteristics of democratic education, the seventeenth with education as a means of promoting the moral progress of the individual, and the eighteenth with the moral progress of society. The nineteenth, twentieth, and twenty-first chapters discuss the application of ethical principles to social organization, industrial and political, national and international. The twenty-second chapter shows the relation of voluntary associations to political and industrial organization, to commerce, to production, distribution, consumption, coöperative credit, etc. The twenty-third chapter traces the development of voluntary associations devoted to scientific research. The twenty-fourth and twenty-fifth chapters deal with methods of research, that is, with the intellectual processes of the scientific investigator. The twenty-sixth chapter, laying emphasis on the volitional processes, studies personal character from the standpoint of a certain school of psychology and from that of the greatest literary artists. In the twenty-seventh chapter modern dramatic literature is considered in its relation to social development and social reform. The twenty-eighth chapter deals with the nature of poetry and other fine arts, the release

and play of the emotions, the functional aspect of the esthetic imagination, etc. The twenty-ninth chapter attempts to trace the development of certain phases of religion. The thirtieth chapter gives a classification of the various branches of theoretical and practical knowledge, based on Professor Münsterberg's well-known classification of the sciences, and thus affords a résumé of the mutual relations of the vocations and the sciences which have been set forth in detail throughout the preceding chapters.

Nothing in this book is beyond the intellectual range of the general reading public. Difficult matters such as personal character, scientific method, and the classification of knowledge, are treated in the simplest possible manner. Every tendency to philosophical speculation is kept well in the background. Intimately associated with the optimistic tone of the whole work, however, is a conviction of the supreme importance, not of the will to believe, but of the will to live and let live, the will to progress.

Only a very rash teacher would venture to prescribe for other teachers his own particular method of presentation. To those who are planning to use this *Introduction to Contemporary Civilization* as a textbook I may say, however, that I have found the material of each chapter, *when presented as a basis of untrammelled discussion*, productive of gratifying results. To regard any part of the book as at all conclusive is to misjudge the intent and spirit of the whole undertaking. The aim is to stimulate the appetite for learning, not to satiate it. The reading lists of books and articles appended to the chapters, which are not bibliographies in the strict sense of the term, will suggest to the student lines upon which he may follow up the discussion of the various topics under consideration. Incidentally, these lists afford me a means of acknowledging my very great indebtedness to the authors of the books and articles in question.

I cannot refrain from mentioning also my deep sense of obligation to certain leaders in the intellectual life of the twentieth century with whom I have come into close contact — university professors and directors of seminars, clinics, and laboratories. Let

me place first of all my teachers at Leipzig, Berlin, and Munich, especially Wundt, Stumpf, Paulsen, and Lipps. I might add the names of other great German teachers, such as Flechsig and Kraepelin, who, though I heard them only on rare occasions, nevertheless gave a permanent direction to my thought and reading. No less influential in fixing my interest in an extended range of subjects were those intrepid thinkers and masters of public discourse, the professors of the Sorbonne and the Collège de France, particularly Lévy-Bruhl, Pierre Janet, Georges Dumas, Durkheim, Tarde, Collignon, Luchaire, Bernard, and Alfred Croiset. I owe much also to special addresses given in Paris by such men as Paul Leroy-Beaulieu and the Italian sociologist Enrico Ferri, as well as to the general cultural life of the place. Among my many revered teachers in America I must express my indebtedness to the late Alexander F. Chamberlain for his wide learning, and to Adolf Meyer for his precision in the application of the scientific method.

Finally, I wish to thank a few personal friends for their interest and assistance in the preparation of this work for the press — Professors A. J. Bell, D. R. Keys, G. S. Brett, J. A. Dale, and Dr. G. C. Workman, the veteran Bible scholar. My gratitude is also due to Professor Henry Crew, my friend and former colleague on the faculty of Northwestern University, who incited me to renewed effort when I faltered in the task of making a survey of so vast a territory as the civilization of our own times.

WALTER LIBBY

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I

THE IDEA OF PROGRESS

The concept Progress, the animating and controlling idea of Western civilization, as it has been justly called, is closely associated with the development of modern science.

It was only inadequately known to antiquity. It is true that the Epicureans, by rejecting the traditional belief in the Golden Age (a state of human perfection in the remote past) and in a subsequent degeneration of mankind, paved the way for the ultimate triumph of the idea of progress. The Latin poet Lucretius, the most distinguished disciple of Epicurus, anticipated to some extent the beliefs and point of view of the modern scientist. In the judgment of that exponent of Epicurean doctrine, the world had been formed, without the intervention of supernatural influence, by the chance coming together of atoms. Man at one time had lived like a beast of the field. Civilization and culture had developed gradually with the slow growth of human intelligence. The writings of Lucretius also mention many special topics that appeal to modern research, such as the acquisition of speech by primitive man, the origin of the use of fire and clothing, the development of metallurgy, building, agriculture, navigation, and fine art, the fabrication of textiles, the founding of towns and cities, the recognition of private property, the establishment of law and government, the institution of marriage and religion, and the substitution of tribal and intertribal harmony for the fierce rivalry and bloodshed of savage life. But although Lucretius and his fellow-disciples realized that the ancient civilizations had been brought about by the gradual improvement of material and social conditions, their writings have in the main a pessimistic and

not an optimistic tone, and suggest resignation to the inevitable course of nature rather than faith in continuous progress.

It is to Condorcet, the French mathematician and revolutionary, and to the Encyclopedists of the eighteenth century that we are indebted for the inspiring modern belief that mankind is on the way up and not on the way down, that history is a record of material, mental, and moral advance, and that we are susceptible of progress through a practically limitless future. The Age of Enlightenment, of which he was one of the representative men, traced its intellectual origin to scientists, and to philosophers touched with the scientific spirit — such thinkers, for example, as Francis Bacon, Descartes, Newton, and Leibnitz. It was an age characterized by a reliance on the power of the human reason and by an ardent desire to advance the cause of human welfare. A firm conviction of the perfectibility of society stimulated the energies of Voltaire, Montesquieu, Rousseau, and other heralds of the French Revolution, and we must credit the naturalist Buffon — though he showed little sympathy with the political tendencies of these contemporaries — with an enthusiastic account of the physical and mental progress of man.

The association between the development of science and the idea of progress is no less close in recent times than it was in the age of Lucretius and in that of Condorcet. The most illustrious champions of the doctrine of organic evolution in the second half of the nineteenth century were fully alive to the bearing of their teaching on the problem of human advancement. In the judgment of Darwin, the fact that man has risen from a humble origin to the summit of the animal scale gives him hope of achieving a still higher destiny in the distant future. Huxley, likewise, speaks of man's long progress through the past as affording reasonable grounds of faith in further advances. For Spencer, civilization is the result of a long series of adaptations whereby man has become fitted to his environment, while progress may be described as the process of effecting these adaptations. Organic progress is an advance from the simple to the complex through successive

differentiations, and the law of organic progress is the law of all progress.

Since the time of Lucretius the idea of progress has undergone no little modification, and, as we shall presently see, it is still subject to criticism and refinement. Condorcet, along with many of his contemporaries, had more faith in the future of mankind than had Lucretius and other Epicureans of antiquity; while the evolutionists of the nineteenth century, interested as they were in the origin or genesis of things, showed themselves more tolerant of traditional beliefs and practices than did the rationalists of the eighteenth century. Nevertheless, the idea of progress is not yet free from the taint of its historic antecedents, and in the opinion of some writers and speakers it is not unassociated today with Epicurean, rationalistic, and materialistic tendencies. One of these critics reminds us, not without point, that some of our grandparents considered it obvious that a nation which traveled sixty miles an hour must be five times as civilized as one which traveled only twelve.

However, many of the recent attempts to define or describe progress are very far indeed from confining attention to its materialistic aspects. Not only is progress identified, in the spirit of Spencer, with the advance of civilization in general, but civilization, in turn, is described as consisting above all of enlightenment. Increased knowledge and intelligence are essential to progress; and, when minds progress, improvement must depend on the minds themselves, both in their native endowment and in their attitude toward improvement. Progress is something to be achieved through the exercise of the human will, not something inevitably resident in the nature of things. What George Eliot called *meliorism*, the conviction that the world may be improved through our volition, and that improvement accomplished in this way constitutes a true evolution, is a practical philosophy fostered by the spirit of modern science.

As fundamental to the many different kinds of progress, Marvin mentions increase of knowledge, increase of power, and an

increase in our appreciation of the humanity of others. Progress in philosophy, science, wealth, art, religion, morals, and politics, may all be viewed in relation to these three fundamentals. In the history of civilization one people has contributed to the development of astronomy, mathematics, medicine, literature, architecture, sculpture, philosophy, theology, politics, and education; another people, lacking originality in almost all of the arts and sciences, has proved preëminent in the formulation and administration of law and government, in building, in the construction of roads, and transportation; while a third people, making few contributions to the sciences, and suppressing art in the interest of monotheism, has exerted a world-wide influence on religion and morals. One epoch, failing to maintain the continuity of the arts and sciences and reacting against the license and debauchery of the age immediately preceding, has placed an almost exclusive emphasis on personal moral improvement. Another epoch, claiming the full inheritance of culture and correcting its own tendency to laxity and unbelief, gives a nobler and less selfish motive to the growth of the religious and ethical spirit. In the words of its most gifted spokesman:

“Thyself and thy belongings
Are not thine own so proper as to waste
Thyself upon thy virtues, they on thee.
Heaven doth with us as we with torches do,
Not light them for themselves; for if our virtues
Did not go forth of us, 'twere all alike
As if we had them not. Spirits are not finely touch'd
But to fine issues.”

As regards society in general, there never has been an age superior to our own in the diffusion of education and in the progress of knowledge. In the organization of knowledge, if not in creative scholarship, pre-war Germany seemed to hold the foremost place among the nations. For rapidity of advance or rate of progress in knowledge during the past decades, Japan carried off the

honors. In less than thirty years after her awakening she absorbed so much of Western civilization as to advance from the condition of a medieval to that of a modern industrial state. Had she not gone to school to the highly developed nations of Europe and America, she would have required a thousand years to accomplish the progress which she actually accomplished in a generation. Whether progress in knowledge is as essential to individual as it is to national development, is subject to question. It is frequently assumed that no person should undertake a course of advanced study unless possessed of an earnest desire to learn. Not a few academicians are convinced that intellectual curiosity and a thirst for knowledge must be regarded as the fundamental college entrance requirement. This conviction, however, is by no means universally held by the students, or the patrons, or the professors of our institutions of higher learning. Many incline to the opinion that the development of the memory is less important than the training of the reason, and that a permanent stock of information is not a *sine qua non* of logical thought.

Those who belittle the importance of knowledge for individual progress are inclined to lay stress on what is called "education for power." In some respects knowledge is power, especially a knowledge of causal relationships. Progress in power, from the educational point of view, involves the training of the judgment, the reason, and the mental processes in general, and includes progress in skill, in the ability to employ foreign languages, to converse, to speak in public, and, in a word, to make oneself effective socially. Educators who place power in opposition to knowledge feel, rightly enough, that there is danger in insisting on the accumulation of useless erudition.

Progress in wealth is a phase of progress in power. Material possessions are so fundamentally important that they cannot be disregarded or passed over lightly in an attempt to evaluate modern civilization. The revival of the arts and sciences in the fourteenth and fifteenth centuries was in no small measure consequent upon the commercial development of Milan, Venice,

Florence, and other Italian cities; and it seems certain that a new artistic and intellectual renaissance must follow the present prosperity of the cities of this continent. If in other chapters there is found an inclination to magnify rather than minify the importance of economic progress, it is because economic progress is fundamental to the civilization of our times. ✕

Progress in appreciation implies increased ability to understand and sympathize with the thoughts, sentiments, and purposes of other people. On it depend, in a very intimate sense, moral, religious, and artistic advances. The range and intensity of the social sympathy of authors and readers, for example, affect the creation and interpretation of imaginative literature. Scott and Dickens, as well as the authors of *Pride and Prejudice* and *Adam Bede*, differ in the scope and degree of their sympathetic appreciation of human character and in the nature of the audience to which they appeal. The ability to divine the ideas and feelings of others is of great importance in politics and diplomacy. It has been said of one of the adroit politicians of our own times that he can state the opinions of his opponents more clearly and forcibly than they themselves. On the other hand, the German diplomatists, as some of them now admit, signally failed in 1914-1918 to appreciate the attitude of hostile and neutral peoples. They could not understand that behind a quiet statement by Grey regarding the invasion of Belgium there lurked a threat of prolonged hostility, and that behind the slow deliberation of American statesmen there was a rising tide of irresistible moral indignation. In private life the ability and inclination to listen appreciatively to what others have to say is characteristic of one admirable, if not of every, type of culture.

The application of statistical methods to the study of human progress indicates that modern civilization has brought great advantages, to a certain extent offset by disadvantages. For example, during the past decades wealth has increased more rapidly than population; and many¹ professed socialists have felt forced

¹ See, however, Philip Snowden's *Socialism and Syndicalism*, pp. 39, 180.

to abandon the claim that the poor of today are absolutely poorer than were the poor of a generation ago. Within the last thirty years the food supply has improved both in quantity and in quality. During the same period there has been a marked improvement in the clothing of the less prosperous classes. In general, better living conditions have been introduced, and consequently there has been a notable increase in the length of life. A reduction has been brought about in the hours of labor, and a diminution in the number of murders and robberies. These gains, however, have been balanced in part by certain losses. There has been an increase in the number of frauds, forgeries, and embezzlements, as well as in the number of cases of suicide and insanity. There has also been an increase in the number of divorces, and a decrease (particularly among the well-to-do) in the number of births.

Lord Balfour, Dean Inge, and others, have subjected the idea of progress to criticism. They differ somewhat in the selection of a point of attack. Before the coming of the gospel of eugenics, Lord Balfour wrote by no means enthusiastically of the prospect of improving the raw material of civilization, that is, the physiological inheritance (treated in chapters three, four, and five of this book) or native quality of the human stock. He ventured the opinion that it was impossible to believe that selection and elimination could play any very important part in the future development of civilized man. Dean Inge, on the other hand, speaking in comparatively recent years, holds that eugenics (treated in chapter five), the science and art of improving the human race by the application of the laws of inheritance in the selection of mates, is the best hope of stopping progressive degeneration. Lord Balfour, again, in a special discussion of degeneration, or the decadence which is alleged to attack great communities and historic civilizations, expresses his faith in the improvement of mankind by the provision of better environmental conditions (treated in chapter two, chapter six, and all the subsequent chapters of this book). There is little hope, he still thinks, of improving the raw material of the human race; but by the perfection of manufacture, that is,

by improving the surroundings into which men are born, the community of the far future may be as superior to us as we are to our barbarian ancestors. His fellow critic, likewise, admits that the accumulated experience and wonderful discoveries of man are of great value, even if they do not constitute real progress in human nature itself.

The wonderful discoveries, thus referred to, include, no doubt, the contributions to human progress of Lavoisier, Dalton, Liebig, Faraday, Henry, Kelvin, Pasteur, Koch, Lister, and other great scientists. Lord Balfour is quite explicit in acknowledging the indebtedness of modern civilization to scientific research. In his judgment the improvement in the last hundred years of the whole material setting of life is due to the combined efforts of those who have advanced and applied the sciences. Moreover, if our outlook on the universe has undergone modifications in detail so great and so numerous that they amount collectively to a revolution, it is to the men of science that we owe it, not to the theologians or philosophers. Without pausing to acknowledge that the scientific spirit has long since pervaded theology and philosophy, he proceeds to say that science is "the great instrument of social change, all the greater because its object is not change but knowledge; and its silent appropriation of this dominant function amid the din of political and religious strife, is the most vital of all the revolutions which have marked the development of modern civilization."

The advance of civilization imposes on mankind a burden of fresh responsibility. As the organization of society becomes more complex, a new type of man is required — more tolerant, more adaptable, with better social as well as intellectual gifts and training. Every advance leaves its train of stragglers, who, though they might have played a less discreditable part in a simpler state of society, cannot adapt themselves to the conditions of contemporary civilization. This submerged minority — the feeble-minded, the criminal, and the incompetent — must be taken into account and firmly controlled. In the highly gifted

youth, who in large numbers are finding their way to college and university, we look for the leaders of the civilization of the future. If we are not merely to maintain but to advance civilization, we must be prepared to incur a lavish expenditure of time and money to fit the young for the tasks of modern society. This is the price of progress.

REFERENCES — Balfour, A. J. (Lord): *A Fragment on Progress*, 1892, and *Decadence*, 1908; Bury, J. B.: *The Idea of Progress*, 1920; Inge, W. R.: *The Idea of Progress*, 1920; Marvin, F. S. and others: *Progress and History*, 1916; Niceforo, A.: *Indices numériques de la civilisation et du progrès*, 1923; Spencer, H.: *Progress, its Law and Cause*, 1882; Todd, A. J.: *Theories of Social Progress*, 1918 (copious bibliography).

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. "The new idea of progress, and our part in it and our responsibility for it, is now practically universal. This idea is due directly to science." (Dr. Robert A. Millikan, as quoted in *The Literary Digest*, April 28, 1928.) Express freely your opinion regarding (a) the general acceptance of the idea of progress, and (b) the dependence of that idea on science.
2. What did Francis Bacon do to win his fame? This question has been raised by a recent essayist, who believes that Bacon's reputation really rests on his literary skill, on the fact that he was a magnificent man of letters, a first-rate stylist. Does this explanation of Bacon's distinction appeal to your intelligence? How did he seek to promote human progress? Have you any doubts concerning the excellence of his literary style?
3. Write a brief essay on the contribution of any one of the following peoples or epochs to the development of civilization: the Greeks, the Romans, the Hebrews, the Middle Ages, the Renaissance.
4. What was the relation of the Renaissance to Pagan culture and to Christianity? Who was the chief poet of the Middle Ages? Who was the chief poet of the Renaissance? Was he Pagan or Christian in spirit? Discuss.
5. Resolved: That the possession of a permanent stock of information gives one an advantage as a logical thinker.

II

THE DEVELOPMENT OF THE OCCUPATIONS

A genetic study of the occupations affords a striking clue to the development of civilization in general. The human mind, ultimately productive of great scientific discoveries, attains its early growth in the quest of daily bread. It is lured by the abundance or goaded by the parsimony of nature. While the physical environment — the character of the fauna and flora, a fertile or sterile soil, a hot and monotonous or a cool and varied climate, the proximity or remoteness of mountains or bodies of water — is exerting a modifying influence on man, he is modifying the environmental conditions, exterminating some species of animals and domesticating others, felling the forests, cultivating useful plants, protecting himself from excesses of heat and cold — in short, making whatever exertions are necessary to assure his survival. The hundreds of millions of people in the world are for the most part engaged in making a living. The need of providing food and drink, clothing and shelter, dictates the daily activities and tends to monopolize the thoughts of mankind. Naturally, therefore, there is a close correlation between the stages of the evolution of the occupations or vocational activities of man and the stages of his general advance. In this chapter, as well as in many subsequent chapters, evidence will be brought forward to show that the more highly civilized a race or people becomes, the greater will be the diversity of its occupations.

The first step in the division of labor is the differentiation of woman's occupations from man's. Primitive woman takes her full share in the responsibilities of parenthood. Her vocation begins in the home but does not end there. The care of children and the

activities immediately connected with the preparation of food and clothing are generally recognized as falling to her lot. She does the cooking, carries wood and water, provides the vegetable food and, in some cases, such animal food as small mammals and shell-fish. Among hunting and fishing tribes the women as a rule dress and tan the skins of slain animals, look after the spinning and weaving, make and mend baskets, nets, tents, blankets, etc. In the early stages of tillage (horticulture) woman usually plays the leading part, and from this there results an improvement in her social status. Where, as in pre-Columbian America, the potter's wheel has failed to come into use, the manufacture of pottery is one of her duties. In certain localities on this continent, quill embroidery, moccasin decoration, and other feminine arts have been so highly developed as to lead to the formation of special craft guilds. Female shamans, or woman doctors, are not unknown among even some of the lowliest primitive peoples. Among the Australian and Melanesian aborigines the part played by woman in public life is rigidly circumscribed. The women of our North American tribes, however, participated to a considerable extent in ritualistic and political activities. Among the Iroquois the women had an important share in directing religious festivals and exerted a controlling influence in the election of the chiefs. They seem to have owned both houses and land, a fact which must be ascribed, along with their general prestige, to their activity as tillers of the soil. Among the Maya of tropical America the women shared with the men the honor of the priestly vocation.

In the early stages of social development there is a remarkable affinity between the priesthood and other vocations. Not infrequently (as in the case of the Maori of New Zealand, for example) the chief of a primitive tribe is both priest and warrior, though the majority of his male relatives and friends — forming the noble class — have no calling except arms. As the community increases in size and complexity, the priestly duties may be delegated to a special professional group, which in the course of time may become more and more distinctly divided into a number of branches

and offshoots. Since the priesthood assumes among its obligations the control of natural phenomena, such as the rain, the wind, and the movements of the heavenly bodies, it is closely related to magic. Since to the priest falls the duty of exorcizing the demons which are thought by nearly all uncivilized peoples to cause disease, there is a similar connection between the priesthood and the medical profession. In parts of Melanesia today all ailments are regarded as punishments visited upon those who have infringed certain tribal restrictions, or taboos; and the cure of each ailment is held to be the function of a specialist capable of propitiating the offended spirit. Accordingly, the medical profession may seem to be highly specialized when, in fact, it is just becoming differentiated from the priesthood. Thus in Egypt in the fifth century B.C. medicine, in the phraseology of Herodotus, was practised on a plan of separation; each physician treated a single disorder and no more. There is no doubt, also, that among primitive peoples in a great many parts of the world a religious and magical significance was attached to scarification, trephining, and circumcision before these operations were performed solely by the professional surgeon. Shaving, hair-cutting, and venesection were likewise long regarded as propitiatory; while the complete differentiation of the callings of the barber and the surgeon is of comparatively recent occurrence. As regards the relation of the priesthood in civilized countries to the other learned professions, let it suffice to mention the influence of the Christian Church on the development of the legal profession and the control that it has always exercised over the schools. The history and the present uses of the term *clerk* (from *cleric*) indicate to some extent the past predominance of the priestly profession over other vocations. Similarly, in certain islands of the South Pacific a great many everyday occupations involve the use of ritual and are consequently associated with the sacred calling. The felling of trees, for example, must not be undertaken without ceremonies intended to placate the tree spirits, or the ancestral ghosts who have taken up their abode in the forest. Throughout Polynesia those who are engaged in spe-

cialized occupations (from which women are excluded), such as the designing of ornaments, tattooing, the carving of clubs, house-building, and the construction of canoes — so essential to the welfare of the natives — are known by a designation (*tufunga*) which is also applied to priests. It is noteworthy that the skilled artizan is here held in especial esteem. The social life of India, like that of Polynesia, is permeated by the sacerdotal spirit. Though one may hesitate to assert dogmatically that the whole system of hereditary castes depends primarily on the division of the Hindu population according to occupation, it is evident that the members of every caste hold the Brahmans in reverence. The Brahmans are considered to have been the original caste, from which the inferior castes became differentiated “in consequence of works.”

From the economic point of view there are eight great basic occupations. Of these, hunting and fishing, even when combined, afford a precarious livelihood and are insufficient for the support of a dense population. Herding, which of course involves the domestication of animals, is an important step toward civilization. The development of the domestic cattle of ancient Egypt from the long-horned wild cattle of northeastern Africa, and the domestication by the early Egyptians of the sheep, ass, goat, goose, and duck, are milestones in the progress of mankind. Carvings on monuments which depict wild animals caught in a corral, to be held for slaughter after feeding, help to explain how in Egypt hunting may have given place to herding. The domestication of the ox enabled the Egyptians to substitute the plow for the hoe in tillage. The development of agriculture, the extensive cultivation of wheat, barley, millet, and other plants, was an even more important advance than herding; for agriculture implies a fixed abode, and makes possible the accumulation of goods in considerable quantities. The practice of irrigation and drainage enhances markedly the value of agriculture in promoting the growth of civilization. It entails foresight, coöperation, and the maintenance of peace; it is associated in history with the early progress of the arts and sciences on the plains of Egypt and Mesopotamia: in fact,

without the practice of irrigation no indigenous civilization worthy of the name has ever come into being in Asia, Africa, or America.

Recent campaigns for the conservation of our forests have helped to awaken the public mind to the importance of lumbering in modern civilization and to the value of trees in relation to the soil and the waterways. Wood must have been no less indispensable in the earliest stages of culture than it is in the latest. It was early used as fuel, and as material for weapons and utensils of various kinds, though, unlike stone, bone, horn, shell, and baked clay, no traces of it remain among the artifacts of prehistoric times. The diversity of uses to which bamboo is put today by certain primitive peoples suggests that wood probably dominated the early stages of human culture far more exclusively than the metals dominate contemporary civilization. It must have been used extensively in what we call the Old Stone Age and the New Stone Age, as well as in all later cultural epochs. In the middle of the eighteenth century charcoal was still the chief fuel employed in the smelting of iron, and even now it holds a place in the preparation of tool steel. Moreover, wood is today the main source of power over vast areas of the earth's surface, on the river steamers of the tropics and on the locomotives of northern Russia.

The influence of mining and metallurgy on the development of civilization has been fully recognized by historians and archeologists. The Copper Age, the Bronze Age, and the Iron Age, though overlapping to some extent, bear a definite relation to the rise and fall of several of the great civilizations of antiquity. Copper, extensively used in Egypt by 3000 B.C., was soon supplemented by bronze. From this alloy were manufactured beads, rings, spears, swords, knives, axes, and other ornaments, weapons, and implements. The use of cut stone in building, strikingly exemplified by the pyramids, was one of the most important results of the introduction of bronze tools. The Ægean civilization resembled the Egyptian in its dependence on metals. The Homeric poems, which are supposed to have been written in the ninth century B.C., but which reflect the culture of a much earlier time, bear witness to

the multifarious uses to which bronze was put in Crete and the other islands of the eastern Mediterranean as well as on the mainland of Greece. The power of the Egyptians, Cretans, and Babylonians declined and that of the Hittites, Greeks, and Assyrians advanced, when the Age of Bronze was succeeded by the Age of Iron. The Hittites, who are credited with the first extensive use of iron, worked the deposits lying to the south of the Black Sea. By the thirteenth century B.C. their empire had grown so strong that it was able to offer a successful resistance to Ramses II. By the close of the eleventh century B.C. iron was extensively used in Greece, and it is probably not a mere coincidence that from that time we must date the rise of the Greek power, which ultimately came to control the whole civilized world. In the eighth century B.C. the Assyrians, having equipped their armies with iron weapons, crushed the opposition of their enemies and founded one of the mightiest military empires and one of the greatest civilizations of antiquity.

By reference to the fundamental occupations — hunting, fishing, herding, farming, lumbering, mining, manufacturing, and trade — it is not difficult for the student of American ethnology to note the achievements and shortcomings of the aborigines of this continent living north of the Mexican boundary. At the time of their discovery they had not emerged from the neolithic stage of culture; they had little or no use of metals; they had no cattle or horses — no domestic animal except the dog; they were without written records or systematized knowledge; and many of them depended for a living on the wasteful exploitation of nature. The Eskimo today are confined to the simplest occupations by the severity of the climate and their state of isolation. There is little diversity of occupation — no agriculture, no trade, no manufacture of pottery. Practically every man is a hunter and fisher. They live in small communities with a minimum of social and political organization. Their dependence on the sea for a livelihood is shown by the fact that from Greenland to Alaska there are not more than two or three inland settlements. Although there is abundant

evidence of their ingenuity (kaiaks, harpoons, bone-carvings, etc.), they have been unable to advance beyond a state of savagery. Their neighbors, the Athabaskan tribes of the Mackenzie River region, are no less restricted in occupation, and are considered to be among the lowest types of American savage. Other tribes of the Athabaskan stock, however, are remarkable for their adaptability, and many instances might be given of their assimilation of the culture of tribes with which they have come into contact. The Navaho, who belong to the southern branch of that stock, afford the most striking example in their adoption of Pueblo culture.

The Haida of the Queen Charlotte Islands, much superior to the Eskimo and the northern Athabaskan tribes, must be regarded as falling little short of the Iroquois in cultural development. Before they were affected by contact with Europeans, they were skilful fishermen, sailors, and hunters. They had an abundant supply of fish, game, seeds, berries, and other natural products. They were particularly expert in the use of wood. They made large cedar dugouts. They coöperated with one another in the erection of commodious houses, built of planks hewn by means of polished stone tools. Their buildings were embellished with paint, totem poles, and other decorations. The individual Haida valued personal property largely as a means of improving his standing in the community, and squandered his accumulated possessions in a feast, or potlatch, marked by prolonged revelry and lavish gifts. The tribesmen seemed naturally inclined to trade and barter, and in connection with the exchange of goods they entered into friendly relations with the tribes of the mainland, by whom they were highly esteemed. Their social organization was much superior to that of the Eskimo and the northern Athabaskan.

The Iroquois were successful not only in hunting and fishing, but also in the cultivation of maize, squash, and beans, for which the women were responsible. When Cartier ascended the St. Lawrence River in 1535, he found tribes of Iroquoian stock occupying the sites of some of the present Canadian towns and cities and cultivating extensive fields of maize. Later accounts of the

Iroquois proper tell of the garnering of hundreds of thousands of bushels of this staple product. They followed a definite method in selecting and planting their seed corn, and, like the Algonquins, they were acquainted with the use of fertilizers. The Iroquois constructed bark buildings with wooden frames, some of which were large enough to accommodate more than a hundred people. As already implied, the Iroquois men treated their women with exceptional respect. They were skilful in political organization and diplomacy, and, before the end of the sixteenth century, there was formed under the influence of their leaders the League of the Five Nations with the purpose of maintaining peace, checking savage practices, substituting legal procedure for the primitive blood feud, and enforcing the observance of those customs which in the judgment of the wisest councillors had proved beneficial.

The Pueblo of southern Colorado, central Utah, New Mexico, and Arizona were at the time of their discovery in the sixteenth century the most advanced culturally of all American aborigines north of Mexico. Though without herds and unacquainted with the use of metals, the Pueblo had developed a system of irrigation farming controlled by the men of the tribes. An arid but fertile soil, along with a summer rainfall sufficient (if carefully husbanded) to insure a harvest, encouraged them to construct extensive canals, which can today be turned to account by the irrigation engineer. The Pueblo cultivated corn, beans, pumpkins, squash, and tobacco. So great was the recognized importance of agriculture that their religious ceremonies and initiation rites were employed to perpetuate the tradition of the proper method of preparing the soil and sowing the seed. They inherited the culture and probably the blood of those ancient cliff-dwellers whose strange abodes may still be seen in the valleys of the upper Rio Grande, the Gila, the Colorado, and their affluents, especially where the canyons intersect the mesa by the Rio San Juan. The Pueblo constructed community groups of adobe houses five or six stories high. They made baskets, blankets, cotton kilts and leggings, and other articles of clothing. They were expert in the

production of pottery. In short, they were a semi-civilized rather than a savage people, and were sharply differentiated from certain abject tribes in the same latitudes which had failed to pass beyond the earliest stages in the development of the occupations.

REFERENCES — Breasted, J. H.: "The Origins of Civilization," *The Scientific Monthly*, 1919-1920; Goldenweiser, Alexander: *Early Civilization*, 1922; Hawkes, E. W.: *The Labrador Eskimo*, 1916; Hodge, F. W.: *Handbook of American Indians*, 1907-1910; Huntington, E.: *Climate and Civilization*, 1924; Lowie, R. H.: *Primitive Society*, 1920; Mason, O. T.: *Woman's Share in Primitive Culture*, 1895; Müller-Lyer, F.: *The History of Social Development* (translated by E. C. and H. A. Lake), 1920; Rivers, W. H. R.: *Social Organization*, 1924.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the study of the division of labor, and of the differentiation of the occupations, is the best approach to the study of the development of civilization in general.
2. Enumerate the so-called fundamental occupations, and show that each involves the modification of man's environmental conditions.
3. Write an essay on the cultivated plants and the domesticated animals for which we are indebted to the aborigines of the American continent.
4. Describe the various irrigation projects carried out by the early Egyptians, Hindus, Babylonians, Chinese, Peruvians, and Mexicans.
5. (a) What metals and what uses of metals do you find mentioned in the *Odyssey*? (b) What light does the *Book of Job* throw on ancient mining and metallurgy?
6. Trace the first steps in the development of the medical profession. Among what people did it first become free from priestly control? What people contributed most to the early development of medical science?

III

THE SELECTION OF PLANTS AND ANIMALS

In order to guarantee the future progress of mankind we must continue to improve the inherent qualities not only of the human species but of all the living things on the productive power of which our welfare depends. In giving particular consideration, therefore, to the great basic occupation of agriculture (the raising of crops and the rearing of livestock), which still demands the daily activities of about thirty per cent of the workers of North America, let us turn aside from such matters as irrigation, the extension of tillage, the improvement of fertilizers and mechanical devices, the many relations between modern farming and chemistry, meteorology, entomology, and other special branches of physical and natural science, and concentrate attention on the extremely important principle of selection. To the clarification of this biological principle, which directs us in the propagation of those types of plants and animals that yield the best returns, both the practical man and the scientific investigator, experience and systematized knowledge, have contributed.

A brief account of the development of two of our chief food and forage plants will enable us to make a logical distinction between the part played by nature and the part played by man in the selection of cultivated plants, however closely these parts are in reality intertwined. There is good reason to believe that all varieties of wheat grown by farmers at the present time owe their origin to such a species as the wild emmer of Palestine and other eastern lands. As in the case of maize so in that of wheat, husbandmen during countless ages had selected the best grains of the largest and fullest ears as seed for another harvest. The selection

of wheat seed became a particularly conscious and systematic procedure among English-speaking farmers more than a hundred years ago. Since the beginning of the twentieth century Marquis wheat, "the most important plant-breeding achievement, in point of money value, that has yet been made," has been developed by selection from other varieties. Red Fife had been crossed in Canada with a number of early-ripening East India wheats in the hope of supplementing the good qualities of the first-named variety. The cross-bred seeds were picked over by the government expert Saunders, and the most promising were planted. After careful study of the individual plants a further selection was made, and the selected strains were propagated separately. To the best of these the name Marquis wheat was given. In the autumn of 1904 the total crop of this new variety might have been held in an ordinary paper envelope; in 1923 more than 375,000,000 bushels were grown in Canada alone. It is now the chief spring wheat of the American continent, cultivated on fully fifteen million acres. It has brought about a great extension of the wheat belt toward the north; for, in addition to its other good qualities, it ripens very rapidly and is, therefore, less liable to be injured by early frosts.

Alfalfa, the chief forage crop of America, grew originally, like wheat, in the countries lying east of the Mediterranean Sea. The scientific name (*Medicago sativa*) associates it with Media, and the popular name is derived from an Arabic expression (*al-faṣṣaḥ*) meaning "the best fodder." Wonderfully adaptable, alfalfa, wherever it grows, spontaneously develops new varieties suited to such natural conditions as temperature, moisture, and the character of the soil. Fifty varieties are found in the Mediterranean basin. Some Siberian varieties flourish in regions where in summer the climate is excessively hot and dry and where in winter the temperature falls at times to 50° below zero C. In this environment the hardier varieties have been selected by nature for survival. By a similar process of natural selection varieties of alfalfa have been developed that resist the climatic conditions in the oases of the African deserts. Alfalfa was carefully preserved in the

west of Europe, notably by the Moors of Andalusia. The Spaniards brought it, more precious than the fabled wealth of El Dorado which they sought, to Central and South America. It was introduced into California after the gold rush of 1849; and throughout North America it is now, like wheat, cultivated on many million acres.

In the judgment of Luther Burbank, contemporary civilization depends largely on the improvement of domestic plants and animals made, more or less consciously, by man in the past, while future civilization must depend more and more on scientific efforts to this end. By experiments carried on in 1903 and subsequent years Burbank succeeded in developing maize from teosinte grass (which grows wild in Guatemala, Mexico, and Florida), thus quickly rehearsing by his special methods of artificial selection what the Indians had no doubt taken many generations to accomplish. As regards economic progress his own most important achievement was probably the development of varieties of thornless cactus, which grow in great luxuriance and excel in nutritive value all or almost all of the grasses. Burbank's experiments with nut-bearing, rapidly-growing trees, with grains, with potatoes, tomatoes, and other vegetables, are sufficiently well known, as are also his production of new varieties of plums, prunes, apples, peaches, berries, and other fruits, and his creation of new kinds of flowers. At times he obtained his results by taking advantage of such varieties as occur spontaneously in nature, as in the development of the perfumed calla, and of the crimson poppy (from the golden-orange California poppy). More frequently he stimulated the occurrence of variations by crossing one kind of plant with another.

Our splendid breeds of cattle, horses, and other domestic animals, have also been developed by what biologists call "man's power of accumulative selection." It has been compared to the magician's wand by which he summons into life whatever form and qualities he will. The artificial selection of animals, like the selection of wheat and maize, has been continued generation after

generation. In the early history of domestication it was largely a subconscious process, the better types of animals receiving better care than the inferior stock and, hence, having a better opportunity to perpetuate themselves. Within the last century and a half the selection of animals has become a more and more conscious and scientific practice. In the second half of the eighteenth century Robert Bakewell, and other British experts in animal husbandry, succeeded in developing various breeds of sheep and cattle, just as within recent years Burbank and Saunders have cultivated special varieties of useful and ornamental plants. In the breeding of animals Bakewell always worked with a definite purpose, believing, as he in rather homely fashion expressed it, that "you can get beasts to weigh where you want them to weigh." He was not blind to the fact that the improvement of stock demands the constant elimination of the scrubs, those specimens among the sheep and cattle which do not conform to the ideal type.

Great Britain, where our three chief breeds of beef cattle were developed by artificial selection, afforded exceptional opportunities in the seventeenth and eighteenth centuries to the activities of the expert in the improvement of domestic animals. The island furnished a wide range of variations, having been subject for ages to invasions of cattle no less than of people. In fact, the invading Romans, Anglo-Saxons, Norsemen, and Dutch, if we may speak of the Dutch as invaders, brought with them into Britain four distinct breeds of cattle. Moreover, at the time of the Roman invasion under Julius Cæsar the Celts had their own black cattle, which in subsequent centuries receded gradually toward the north and west. After the withdrawal of the legions in the fifth century, some of the white Roman cattle became feral. Specimens of this wild white breed are still preserved in isolation at Chartley Park, and on several other estates in England and Scotland. When the Angles and Saxons gained a foothold in Great Britain, their red-coated cattle became the predominant breed in southern England, where it retained supremacy for many centuries, though with

probably some admixture of the earlier Celtic and Roman breeds. Well on in the seventeenth century the old black breed continued to hold its own in Lancashire, Cheshire, Staffordshire, Derbyshire, and in general throughout the north and northwest of the island. But before the beginning of the eighteenth century excellent cattle from the Continent were introduced into Herefordshire in the west of England and into Lincolnshire and other counties of the east.

The modern Shorthorn, the most widely distributed breed of cattle in the world today, sprang in the main from this imported stock. Before the end of the eighteenth century it had become the prevalent type in the east of England from the Wash to the Tweed. New high-grade stock was imported directly from the Netherlands to Durham, and a spirit of emulation arose among the graziers and landed proprietors of the northeast. The mixture of Dutch stock with the older English breeds resulted in a particularly wide range of variation. It was Charles Colling, a pupil of Bakewell's, who best turned to account this opportunity of developing a new breed by selection. Bakewell had plied his activities in the midlands, where all the major breeds of cattle were represented, and, traveling throughout England in the early part of his career, had again and again recruited his stock by animals selected from other herds. Master and pupil were alike not only in having diversified material from which to make a selection but also in the practice of rigidly maintaining the purity of their stock by inbreeding just as soon as they had secured the type of cattle they were bent upon developing. So closely did Colling follow the example of his master in this respect that all the Shorthorn herds distributed throughout the continents today trace their descent from one particular ancestor, Colling's "Comet" (1804). All the other offshoots of the original breed were sacrificed in order that this chosen race might survive.

The Hereford and Aberdeen-Angus breeds, the two other great breeds of beef cattle, have also resulted from selecting the best of the variants produced by the intermixture of different kinds of

stock. There is record of the importation of cattle from Flanders to Herefordshire between 1650 and 1700. The modern Hereford breed is largely the result of crossing these imported cattle with the red Anglo-Saxon stock of the south of England. To their Flemish progenitors the Herefords owe their great size, and, probably, the white or diversified color of the head, as well as of their underlines; while to their Anglo-Saxon inheritance belongs the prevailing red of their coats. The geographical position of Herefordshire tends to strengthen the belief that the blood of the older British breeds, certainly of the original Celtic cattle, must be present to some extent in Hereford stock.

Aberdeen-Angus cattle were developed from a mixture of the old black, horned, Celtic stock with the light dun (silver gray), hornless, Scandinavian stock found in Aberdeenshire, Forfarshire,¹ and the adjoining counties of Scotland. In accordance with scientific laws to be explained in a later chapter, the hornlessness of the Norse ancestry and the color of the Celtic ancestry eventually prevailed. However, it was only when great size was attained — through further mixture of the black, hornless progeny with Shorthorn stock — that a really notable new breed was established. In the early years of the nineteenth century Hugh Watson brought the Aberdeen-Angus breed almost to perfection, following on the whole the principles of Bakewell and Colling. The scene of his activities was the border of Forfarshire¹ and Perth. In the case of the black, polled Aberdeen-Angus cattle developed by him, as in the case of the Herefords and the Shorthorns, it is remarkable that what we call pure-bred stock was, to begin with, something highly composite, and that the pure breed was created through the selection of the best individuals in a field offering a great diversity of types, and — the selection having been made — through the isolation of these particular animals. As already implied, it is by breeding persistently to the ideal type and by eliminating all offspring that fail to conform to this type that the so-called pure breeds are developed. One eminent writer on animal husbandry adopts Zang-

¹ This county has recently taken the name Angus.

will's expression "The Melting Pot" to describe the mixture of breeds which affords the expert in selection a favorable opportunity; but a mere mixture of breeds, or of races, without the exercise of selection is not considered an indubitable advantage.

The authoritative statement that the most exalted breeds have attained their eminence through the mingling of diverse strains and races admits of extended application. Hybridization opens the way to the improvement of domestic fowl, sheep, horses, and swine, as well as of cattle and cultivated plants. Barred Rocks, for example, and Rhode Island Reds no less assuredly, are the result of combining the good qualities of several distinct varieties. The like is true of Hampshire Down sheep, and even of the Leicester breed first improved by Bakewell. The Percheron horse, which has been called France's greatest contribution to the advancement of agriculture, can be traced in history to the times of Charles Martel, when after the defeat of the Mohammedans at Tours (732) Arab and Barb horses were introduced among the native heavy horses of le Perche. Between 1755 and 1820, there were successive infusions of Danish, English, Belgian, and improved Arab blood. A similar account might be given of the development by intermixture and selection of the draft horses of Great Britain — the Clydesdale and the English Shire breeds. We shall not dwell on the relationships between the domestic horse, modified by ages of artificial selection, and the wild horse still to be found on the plains of Mongolia, the wild ass of Asia and Africa, the quagga, the zebra, and the various types of prehistoric horse.

Such an odd form as the giraffe suggests that natural selection has been no less effective among animals than we have seen it to be, in the case of alfalfa, among plants. One is led to conjecture that just as all varieties of alfalfa save the hardiest have been winter-killed by the intense cold of northern Siberia, so all the varieties of giraffe and closely allied species that lacked the size, speed, shape, color, etc., necessary for survival have been killed off by carnivorous enemies, by drought, by the scarcity and inaccessibility of food supply, and by other destructive agencies. For an

animal chased by enemies, or threatened with annihilation through lack of food, a slight superiority in speed, a power to resist attack or to escape detection by the dappled markings of its coat, a height that would enable it to feed off the branches of the acacia-trees, or an adaptability to a new kind of fodder, might decide the question of survival or extinction. Those who are most observant of the structure and habits of the giraffe — the elongated cervical vertebræ, prehensile upper lip, remarkably motile tongue, the fleetness of the animal, its range of vision, and its ability to kick quickly and vigorously in almost any direction — will be least inclined to question the influence of environment on its development. There are two related fossil forms, both of which lack something of the height and reach of the living species. The okapi, brought to the knowledge of the scientific world by Sir Harry Johnston in 1899, and described as the giraffe's nearest ally, is a more primitive and less highly specialized animal. It is closely related to one of the fossil forms, and appears to be intermediate between the extinct species and the giraffe. The okapi has barely succeeded in making good its survival in the well-nigh inaccessible forests of the Upper Kongo Valley.

We shall not take time to study the partial domestication of the arctic and the silver fox, which might serve to illustrate the first steps by which man takes advantage of and supplements the modifications produced by nature in the lower animals. But we must hasten, before proceeding to the discussion of trade, war, law, medicine, manufacture, transportation, and others means of altering environmental conditions, to consider the bearing of selection on the differentiation of the races of man and the improvement of the inherent qualities of the human stock on which the development of the vocations and of civilization in general depends.

REFERENCES — Burbank, L.: *How plants are Trained to Work for Man*, 1912; Jones, D. F.: *Genetics in Plant and Animal Improvement*, 1925; Lydekker, R.: *The Horse and its Relatives*, 1912; Mivart, St. G.: *Dogs, Jackals, Wolves, and Foxes*, 1890; Plumb, C. S.: *Types and Breeds of Farm Animals*, 1906; Wilson, J.: *The Evolution of British Cattle*, 1909.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the cultivation of plants and the domestication of animals were the chief steps in man's progress from savagery to barbarism.
2. Discuss Burbank's dictum that the civilization of the future must depend more and more on scientific efforts to improve our cultivated plants and domesticated animals.
3. Explain clearly the distinction between natural selection and artificial selection, and illustrate each by reference to (a) plants, and (b) animals.
4. How many species of plants and animals are there, approximately? Is the number of organic species increasing or decreasing? What is the difference between a species and a variety?
5. Give a brief account of the different kinds of fossil horse.
6. Explain with illustrations the statement that the so-called pure breeds of domestic animals are in reality highly composite.
7. How is the elimination of inferior stock effected in (a) natural selection, and (b) artificial selection?

IV

THE RACES OF MAN

How has race become differentiated from race? Has natural selection been as potent in the production of human types as in the development of plants and lower animals? The races of man, comparable, as the term implies, to the breeds of domestic animals, and similar to the varieties of other living species, include such obvious divisions of mankind as the Caucasian race, which has dominated Western civilization during the past centuries, the Mongolian, the Negroid, and the Australian. These grand divisions as well as the numerous subdivisions (Nordic, Alpine, Mediterranean, etc.) of the human species have become differentiated not only culturally but as regards color (pigmentation), the texture of the hair, stature, the relative length and breadth of the head, the capacity of the skull, the size and structure of the brain, and other physical characters. Cranial capacity, for example, is found to vary progressively as we pass from the examination of the Australian aborigines to that of the Polynesians, the Asiatic Mongolians, and the European Nordics and Alpines. The desire to discover the causes of these racial differences, which, unlike differences in language and nationality, are biological rather than social, must be shared by every alert mind, whatever its prepossessions concerning the origin of the human species. Uniformity of environment tends to racial homogeneity, and diversity to heterogeneity. Such a series of occurrences as surplus population, drought or other unfavorable environmental conditions, migration, the mingling of different human stocks, and consequent hybridization, leads naturally to the production of abundant variations. Among an immigrant people, already differentiated from the parental stock through certain in-

herent qualities, indicated by their spirit of enterprise, by their resistance to famine, disease, and the perils of the way, as well as by other advantages in the struggle for existence, the new environment proves fatal to certain variants but favors the perpetuation of others. While this sifting-out process continues, the possession of a definite habitat, comparative freedom from further racial intermixture, ready communication within the group, and inbreeding, all tend to produce a new stability and uniformity. Thus in America at the present time new races seem to be forming, superior in the main to the races from which they derive their origin. In the case of each of these new American races the preservation of identity must depend, of course, on the control and assimilation of the incoming foreign elements.

The ancestors of our American Indians, the first immigrants of the New World, entered this continent from northeastern Asia at least ten thousand years ago. They were in the main of the same racial group as the Malays and the Mongolians proper, a group superior to the Negroes (in weight of brain, for example) but inferior to the Caucasians. The present Indians are darker, taller, and less uniformly broad-headed (brachycephalic, from Greek *brachýs*, short, and *kephalé*, head) than the Chinese. These differences, however, may not be wholly attributable to such selective influences as immigration and the American environment, for there are good reasons for believing that the Mongolian proper has become more differentiated from the common early Mongoloid stock than has either the Indian or the Malay. It is noteworthy that, among the American Mongoloids (a fairly homogeneous race), the Eskimo people, living in a distinctive environment, "appears to be the most particularized subvariety." Certain highly differentiated types of American Indian, moreover, came to prevail in the marginal area of North America, both toward the northeastern part of the continent and toward the southwestern. Are we to suppose with Professor Dixon that these long-headed (dolichocephalic, from *dolichós*, long) tribes represent earlier incursions from Asia (early Negroid, early Australoid, etc.) driven to the

peripheral areas of North America by succeeding waves of immigration, or shall we rather take it for granted that all the immigrants were of one stock and that they became gradually differentiated among themselves through the influence of special environmental conditions?

If we adopt the former hypothesis, we must also assume that portions of the various peoples to enter America by way of Bering Strait passed in succession through the Isthmus of Panama, and that the early Negroids, etc., debouching in South America, were driven to the same relative position as their kinsmen continued to occupy in North America; for the Indian population is little less complex in the southern half of the continent than in the northern half, and long-headed tribes occur in northeastern Brazil and other peripheral areas of South America. It is much more credible that a modification of the original stock was brought about through the influence of the coastal environment. This assumption is supported by the fact that the Mohawk are known to have undergone modification from broad-headedness (brachycephaly) to long-headedness (dolichocephaly), and that Boas, one of the greatest authorities on anthropology, has found similar changes, which he thinks directly owing to American environment, in the descendants of certain classes of European immigrants.¹ Though such differences of physical type as exist among American aborigines may be ascribed to local influences, it is not altogether improbable that the remarkable cultural differences between the less advanced tribes on the one hand and the Inca, Maya, and Aztec on the other may have been owing in part to pre-Columbian contacts with the civilizations of the Orient, and a consequent diffusion of culture.

The Negroes of the United States have, since they were brought to this continent as slaves, become less obviously differentiated among themselves, both culturally and physically, than have the American Indians. Such exceptions as the inhabitants of the Sea Islands, who still retain some memory of their African speech,

¹ The conclusions of Boas in this matter have been disputed by Sergi, Hrdlicka, and others

superstitions, and customs, help to emphasize the fact that the cultural conditions in America have molded the tribesmen of Nigeria, Dahomey, Togo, and other parts of Africa, into an apparently homogeneous people. According to the best authorities the colored people within the boundaries of the United States have progressed, especially since emancipation, both materially and morally. From the cultural point of view they continue, moreover, to give promise of an advance to which no limits can be set. At the same time they still share with the ancestral stock physical characters in which can be read the history of the early development of the Negroid racial group. Attention has been called, for example, to the length of the Negro's arm, especially of the forearm, the breadth of his scapula, the lumbar curve of the spine (less marked than in the Mongolian or the Caucasian), the narrowness of the sacrum and of the pelvis in general, the peculiarities of the lower extremity, the massiveness of the cranium, the disproportion between the width of the brow and that of the cheek-bones, the flatness of the nose, the formation of the palate, and the forward thrust of the lower part of the face (prognathism, from Greek *pró*, before, and *gnáthos*, jaw). Some indication of the line along which the Negro has developed is afforded by the characteristics of such Negroid races as the remarkably primitive Bushmen (and their kindred, the Hottentots) isolated in the southwestern part of Africa, various Pygmy races, the widely distributed Negritos, and, finally, the Melanesian tribes from Papua to the Fiji Islands. Striking cultural resemblances may be traced also among certain primitive peoples scattered throughout Australia, Melanesia, and Africa.

For immigrants from Europe, as for immigrants from Africa, America has been a melting pot in which heterogeneous ingredients are reduced to comparative homogeneity. Europe, peopled in prehistoric times by a long-headed race from the north of Africa, according to one surmise, and subject for ages to the invasion of straight-haired, broad-headed races from the Asiatic plains, gave rise to a markedly heterogeneous population partly through the

influence of its mountain barriers, islands, and peninsulas as well as through its diversified temperature and other climatic conditions. Partial isolation, the occasional intermixture of distinct peoples, rivalry (individual, tribal, and racial), together contributed to the production and perpetuation of particular breeds of men. In Europe today, though the intermingling of peoples has invalidated all claims to absolute purity of race, three chief racial types — the Mediterranean, the Alpine, and the Nordic — may still be distinguished.

Of these the Mediterraneans, characterized by dark hair, eyes, and skin, low stature, and long head, are supposed to represent the oldest surviving settlers of Europe. The Mediterranean race retains its greatest purity in parts of the Iberian peninsula, cut off from the rest of the continent by the Pyrenees. It is still predominant in Sardinia, Sicily, and southern Italy. It is an important element in the coastal population of southern France. Vestiges of this racial substratum may still be found in the western counties of Ireland and England, in South Wales, and in parts of Scotland. To the Mediterranean race of Europe must be credited a preponderant share in the development of Greco-Roman civilization; while to the dark-haired Caucasian race in general, of which the European Mediterraneans form a part, the civilizations of ancient Egypt, Crete, Phenicia, Judea, Mesopotamia, as well as of Arabia, India, and remoter lands, must also be largely ascribed.

From the Mediterraneans or from their prehistoric ancestry, recognized by many authorities as the first representatives in Europe of *homo sapiens*, are derived the modern Nordics, found in their greatest purity today in the interior of Norway and Sweden. According to Ripley it is fairly well established that the Nordic or Teutonic race of northern Europe is merely a variety of the primitive long-headed race of the Stone Age, and that its distinctive characteristics have been gradually acquired in the relative isolation of Scandinavia through the modifying influence of environment and of artificial selection. Madison Grant, likewise, believes that so clearly marked a race as the Nordic, the white race

par excellence, "characterized by certain unique specializations, namely blondness, wavy hair, blue eyes, fair skin, high, narrow, and straight nose, which are associated with great stature and a long skull, as well as abundant head and body hair," was the product of a rigid natural selection. This people was so placed geographically as to be isolated and protected for long ages from the intrusion of lesser breeds. Thus all the weaker elements were providentially purged away by the conditions of a rigorous environment. The long, hard winters tended to eliminate defectives, and demanded the exercise of diligence and foresight during the short summer season in order that food and clothing and shelter might not fail when they were most needed. We may accept in the main this view of the selective process by which the Nordic race was developed, without overestimating the extent to which the Scandinavian peninsula was at any time exempt from racial intermixture and without lending credence to the Germanic myth of a nation of blond dolichocephalic giants, be it of the past or of the future.

In fact, the Alpine race forms a large part of the population of the southwestern coast of Norway. It is no inconsiderable element of the population of the eastern provinces of Prussia, and it predominates in the Thuringian Forest, in the Black Forest, and in the highlands of Bavaria, Württemberg, and of South Germany in general. To this so-called Alpine race, probably of Asiatic origin, must also be reckoned the Czechs, the Slavs of Russia, as well as the Swiss mountaineers, the Piedmontese and other inhabitants of northern Italy, and the French of Savoy, Alsace-Lorraine, the Vosges, the Ardennes plateau, and other isolated areas. Outposts of this race are found in Brittany and other marginal districts of western Europe. The Alpines may be described as a wedge driven between the two great long-headed races of Europe. The stature of the Alpines, as well as the color of their eyes (gray, hazel, brown), hair, and skin, mark them as intermediate between the tall, blond Nordics and the short, brunet Mediterraneans. One might readily believe that the Alpine race was the result of the mingling of the

other European races, especially as its stature and blondness vary with the latitude, were it not for its distinctive characteristic, namely, breadth of head. Even this, though generally considered less responsive to the influence of environment than pigmentation and stature, may, in the judgment of some investigators, be correlated with the upland propensities of the race. Though it is not easy to regard altitude and brachycephaly as cause and effect, it is remarkable that in France and Switzerland, for example, the broad-headed types hold steadfastly to the highlands, while the long-headed types permeate the river valleys or make their abode in the open plains.

It is at least fairly plausible, then, that the three great European races, as well as the American Indian and the American Negro, derive their origin from other continents and from more fundamental racial stocks. The present Alpine race, in so far as it is free of Nordic and Mediterranean elements, traces its descent, as do the Lapps and other European Mongoloids, from Asia. The American Indians, as we have seen, are descended from an early Mongoloid stock, as are also the Mongolians proper and the Malays. The African Negroes are closely related to the Melanesian tribes of the islands lying north and northeast of Australia. Moreover, the aborigines of Australia, who share the characteristics of the Negroes and the Malays to so great an extent that they have frequently been considered the result of a mixture of these races, are in the main lower than either, both culturally and physically. The Australian tribes at the time of their discovery, though differing among themselves according to their surroundings and resources, lived in a state of primitive savagery, without any knowledge of agriculture, addicted in some localities to cannibalism, seeking to placate by human sacrifices the evil spirits in which they believed, and practising other hideous rites. This backward race was divided into hundreds of independent and hostile groups, some of which had hardly attained to the cultural level of the Stone Age. In physical structure the Australian aborigines resemble the Negroes as regards the profile of the spine in the lumbar region, the nar-

rowness of the sacrum, the form of the palate, and the shape of the foot. Their cranial capacity is smaller, and their prognathism is more pronounced. The prominence of the eyebrow (supraorbital) ridges is a distinctive physical characteristic of the Australian aborigines.

Is there evidence that the highly developed races of man have relatives still more humble than these Australians and the Bushmen of Africa? Is the human species associated with some wild stock, as cultivated wheat is associated with emmer, corn with teosinte grass, the giraffe with the okapi, the domestic horse with its Mongolian prototype, and the dog with the wolf? Of the rapidly accumulating evidence that a wild human, or subhuman, stock existed in prehistoric times the most impressive part is that which relates to Neanderthal Man — *homo neanderthalensis*, a species distinct from *homo sapiens*. Since the middle of the nineteenth century many specimens, including complete skulls and skeletons, of this fossil man have been unearthed. The separate discoveries, more than twenty in number, range from Spain to Czechoslovakia and from Jersey to Jerusalem, and — much further afield — include finds made in Rhodesia and the Gobi Desert. The fossils thus far recovered indicate that the Neanderthal Man was more brutal than the Australian of today, that his skull was narrower, that his supraorbital ridges were more prominent, and that his jaws, furnished with characteristic teeth, were more protruded. Further significance is attached to his broad scapula, his powerful shoulders, the form of the spine and the knee joint, the receding chin, and the large and clumsy hand. The various specimens, though they permit us to form a tolerably clear picture of this extinct species, show gradations among themselves. Not only so, but all the prehistoric races of man, including *homo neanderthalensis*, have been described as representing stages of advancing and progressive development, in which Osborn and other competent authorities recognize the record of a continuous creative process.

REFERENCES — Boas, F.: *Changes in Form of Body of Descendants of Immigrants*, 1911; Dixon, R. B.: *The Racial History of Man*, 1923; Grant, M.: *The Passing of the Great Race*, 1916; Hankins, F. H.: *The Racial Basis of Civilization*, 1926; Huntington, E.: *The Character of Races*, 1925; Johnston, Sir H. H.: *The Negro in the New World*, 1910; Kroeber, A. L.: *Anthropology*, 1923; Osborn, H. F.: *Men of the Old Stone Age*, 1915; Ripley, W. Z.: *The Races of Europe*, 1900; Smith, G. E.: *Evolution in the Light of Modern Knowledge*, 1925; Thomson, J. A.: *The Outline of Science*, vol. IV, pp. 1093-1104, "Ethnology," 1922 (bibliography).

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the Nordics have contributed more than any other race to the development of civilization, and, therefore, that the governments of Canada and the United States should give particular encouragement to the immigration of representatives of the Nordic peoples.
2. Describe the physical characteristics of the European Alpines, and distinguish them from the Nordics and Mediterraneans.
3. Write an essay of three or four thousand words on "The Differentiation of Languages," dwelling mainly on the development of the Indo-European group of languages.
4. Have the differences found today among the aboriginal tribes of the American continent resulted from the influences of heredity or from the influence of environment? (I recommend any student discussing this question to consult Taylor, G.: *Environment and Race*, 1927. This work tends to corroborate the view expressed in Dixon's *Racial History of Man*.)
5. Mention other types of fossil man besides Neanderthal Man, and describe any one of these types.

V

ARTIFICIAL SELECTION APPLIED TO MAN

Can the fundamental occupation of parenthood be turned to account in the improvement of the human species? Can we by foresight curtail the number of the criminal, feeble-minded, and incompetent? Can the inherent qualities of the race, what Lord Balfour calls the raw material of civilization, be so controlled that the coming generations will be equal to the difficult tasks of a progressive society — such as the reorganization of commerce and industry, the substitution of right for might, the advancement of medicine, education, and government, the extended application of the scientific method, the enrichment of the fine arts, and the clarification of religion? No one can deny the possibility, at least, of improving mankind through the conscious control of heredity. We have seen that through natural selection certain species of plants and lower animals, as well as certain races of man, are doomed to extinction, while certain other species and races survive; and that through artificial selection those types and lower animals may be sifted out which seem most profitable. All, or almost all, that man now is, says an eminent American biologist, he has come to be without conscious guidance. The remarkable progress of man, to which the difference between the most highly civilized peoples and the lowest savages bears witness, has come about in the main without our planning or intervention. Is it possible to improve on the natural method of evolution? Perhaps not. Nevertheless, it may be possible to expedite the evolutionary process. "Man cannot change a single law of nature, but he can put himself into such relations to natural laws that he can profit by them."

In one sense, it must be conceded, artificial selection has contributed throughout the ages to the betterment of mankind. The choice, spontaneous or deliberate, of mates in marriage has helped to determine which types should be perpetuated and which should be cut short. The importance of this kind of selection is implied in the behavior and conversation of the majority of men and women. Its vital significance finds its most striking expression in *belles lettres*, music, painting, sculpture. Here the poets and other artists are in closer accord than are the philosophers with the general sentiments and judgments of mankind. An appreciation of the social function of the creative esthetic imagination and of such forms of emotional expression as the opera and the drama challenges the comprehension of a certain type of intellectual man. Thus even to Emerson the value and purpose of Shakespeare's art proved a baffling mystery. "As long," he writes, "as the question is of talent and mental power, the world has not his equal to show. But when the question is to life, and its materials, and its auxiliaries, how does he profit me? It is but a *Twelfth Night*, or a *Midsummer Night's Dream*, or a *Winter Evening's Tale*: what signifies another picture more or less?" The vindication of art in the face of this austere arraignment by the New England philosopher might be attempted in many different ways. Let it here suffice to state that from our present point of view it appears that Shakespeare, the supreme human intelligence, did not go astray in devoting his poetic genius to the portrayal of men and women in their daily social relationships and, above all, in delineating what many feel to be the greatest thing in the world, ideal youth and passion, the promise and potency of the improvement of the race.

The preference for strength and beauty in the choosing of mates, which, if not absolutely instinctive, is almost universal, is supplemented among a great many people by the practice of infanticide. The history of Greece, for example, gives clear evidence of the exercise of some degree of foresight in these forms of selection. We are told that Greek men chose their wives with an eye to the health and vigor of the prospective offspring. As early as the

sixth century B.C., one of the poets (Theognis) lamented the lowering of standards in the choice of mates through the insidious influence of wealth. His testimony is cited here not as indicating the corruption of any particular epoch but as proving the existence among the Greeks of a long-established custom of making eugenic marriages. The cruel Spartan practice of systematically doing away with defective children shows, at least, that the Greeks had come to a definite recognition of the burden on the commonwealth such offspring might entail. This view of the social significance of good breeding was supported in the fifth and fourth centuries B.C. by the Greek philosophers, particularly by Plato, who maintained that in the interest of the city-state all of the children of vicious parents, as well as all other children showing defects, should be exposed after the Spartan manner. Aristotle, in the spirit of his master, also held that no imperfect child should be reared.

The modern scientific study of inheritance is based largely on the theory of organic evolution as enunciated by Darwin and Wallace in 1858. The fact of biological overproduction had been impressed on both of these scientists. They maintained that men, as well as other animals, tend to increase at a greater rate than the food supply. From this overproduction there results the struggle for existence, of the occasional fierceness of which both Darwin and Wallace had seen abundant evidence during their travels in South America and elsewhere. They had observed also the variations that occur in species of plants and animals in the wild state as well as under domestication. They were convinced that in the struggle for existence even a slight variation might determine the survival or extinction of a plant or animal. As we have seen in the case of alfalfa, as well as of the giraffe and its congeners, by a process of natural selection one type is extirpated and another continues to propagate. The less fit perish and the fitter survive. Finally, on the principle that like begets like, it seemed probable that favorable variations, having once occurred, would be perpetuated.

A few years after the appearance of the *Origin of Species*, Francis Galton, Darwin's cousin, sought to apply the theory of

organic evolution to the consideration of the improvement of the human stock. He was the first to speak of "Eugenics" (from *εὐγενής* — well-born, or of noble race), which he defined as the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally. His first contribution to the literature of the subject was a magazine article on "Hereditary Talent and Character" (1865). This he followed up with a work on *Hereditary Genius* (1869), in which he furnished decisive proof that the manifestation of pre-eminent ability runs in families. A few years later Alphonse de Candolle (*Histoire des Sciences et des Savants*), who was primarily interested in the social conditions favorable to scientific genius rather than in its biological causes, confirmed in part the results of Galton's investigations; while through discussion he ultimately established the fact that the number of great men per century increases with the advance of civilization and that genius is more frequently in evidence (as one might expect) among the highly educated and well-to-do classes of society. Galton made use of statistical methods in his researches concerning the transmission of exceptional abilities in the families of jurists, statesmen, soldiers, clergymen, literary men, and scientists. He took account of such characteristics as eye color, stature, cephalic index, temperament, and conscientiousness, as well as of the distinctly intellectual qualities. In 1897 Galton formulated his so-called law of ancestral inheritance, which, however, has been in great measure discredited since the rediscovery of Mendel's Law.

Gregor Mendel, monk and later abbot in the Augustinian monastery at Brünn, Moravia, had carried on between 1858 and 1866 a series of experiments on the inheritance of plants. He crossed a number of well-established varieties of garden peas, differing in such individual, or unit, characters as length of stem, color of seed coat, regularity of contour, color of food material in the seed, and form of pod. When he crossed pure races of (1) green-seeded peas with yellow-seeded, (2) round-seeded with wrinkled-seeded, and (3) long-stemmed with short-stemmed, all of the hybrid offspring

immediately resulting from these three crosses showed only one of the contrasted unit characters. In the first case the hybrids had yellow seeds, in the second round seeds, and in the third long stems. These characters, yellowness of seed, roundness of seed, and length of stem, are *dominant*; while the contrasted characters, which failed to appear in the first generation of hybrids, are *recessive*. When, however, these hybrids were allowed to reproduce under conditions of self-fertilization, the dominant and recessive characters appeared in their offspring — the second filial generation — in the ratio of three to one on the average. For example, a number of hybrids of the first cross, self-fertilized, yielded 6,022 yellow peas and 2,001 green; hybrids of the second cross yielded 5,474 round peas and 1,850 wrinkled; and hybrids of the third cross yielded 787 long-stemmed plants and 277 short-stemmed. All the peas of the second filial generation showing the recessive characters continued to breed true to the original pure races of green, wrinkled, and short-stemmed peas. One-third of the second filial generation showing the dominant characters continued to breed true to the original pure races of yellow, round, and long-stemmed peas. The remaining two-thirds of the second filial generation to show the dominant characters continued to breed like the first generation of hybrids; that is, they produced one-fourth pure recessives, one-fourth pure dominants, and one-half, like themselves, impure dominants.

What is the range of application of this law of inheritance? Rediscovered in 1900 by Hugo de Vries and other botanists, it was soon found to hold true in the breeding of animals. For example, if a black guinea-pig of pure race be mated with a white guinea-pig of pure race, all the immediate offspring will be black; and if these hybrids be mated among themselves, the second filial generation will be one-fourth pure-race blacks, one-fourth pure-race whites, and one-half blacks of impure dominant breed. Among domestic cattle blackness of coat and hornlessness are dominant unit characters. Mendel's Law thus enables us to explain the principles underlying the development of Aberdeen-Angus cattle and

other well-known breeds. Knowledge of this law indicates how a certain type of animal may be produced through the combination of desirable characters. Thus by mating black-faced, hornless Suffolk sheep with white-faced horned Dorset sheep a permanent new breed of white-faced hornless sheep was readily established. Many anomalies present themselves, it must be admitted, when we attempt to extend the application of the apparently simple law of inheritance. It is found, for instance, that no one factor determines the size of cattle or the ear length of rabbits. But whether these and similar cases of blended inheritance are owing to the presence of multiple unit characters or are to be explained on principles other than the Mendelian, it is generally agreed, as Professor Castle states, that the same laws govern inheritance in man as in other animals and in plants. In fact, Mendel's Law, combined with the investigation (to which it has given fresh impetus) of the chromatin in the nuclei of the germ cells, offers a clue to the hitherto baffling problem of human inheritance.

So far the study of Mendelian inheritance in man, though promising, has furnished rather meager results. Investigations have been made concerning the application of Mendel's Law to the inheritance of color-blindness, of atrophy of the optic nerve, of congenital deafness, of chorea, of hemophilia, of diabetes, of certain malformations of the hand, of eye color and pigmentation in general, and of hair texture. Though these and similar initial investigations have been largely concerned with the inheritance of physical characteristics, it must not be inferred that, in preparing to apply the principle of artificial selection to the human species, intellectual and moral characteristics should be left out of consideration. Valuable studies have been made regarding the inheritance of feeble-mindedness and of susceptibility to other forms of mental disease. The emergence of man above the mass of lower animals, after a period of intense struggle and drastic selection, involved the triumph of mind over matter, or at least of brain over brawn. We measure his advance by the growth of the cerebrum, the development of speech, and, consequently, of the subtler men-

tal processes. The higher social qualities were called into play no less than the purely intellectual. An advanced civilization must be supported by good native endowment; but the fact that human inheritance, in order to be adequate, must include much more than such indications of good physique as one looks for in the rearing of horses and cattle, is obvious to any student of history. The Spartans, selecting and perpetuating those types that served to maintain the military prestige of the city-state and treating all other types with comparative neglect, put so exclusive an emphasis on physical equipment as hampered the development of literature, art, philosophy, science — all that made Greece pre-eminent in the history of civilization — and limited the expansion of Sparta as a political power.

In studying the decline of the great civilizations of the past we cannot ignore the evil effects of the gradual loss of the original racial inheritance, though we need not belittle other causes of decadence, such as the destruction of books and buildings by fire and the deterioration of cultural equipment in general. It is by no means improbable that the fall of Greece and Rome was largely the result of the weakening of the stamina of their peoples through the inroads of malaria and other diseases. War and proscription also played a part in breaking down the wonderful stock that had made the classical civilizations of antiquity possible. No less obvious is the injurious influence of the disproportionate admixture of the blood of other peoples. The tendency of the patrician and successful classes to have small families no doubt likewise contributed to the undoing of the ancient civilizations. The decay of empire is closely associated with the loss of racial inheritance. Thus far, as Professor Holmes remarks, "civilization has tended to cause the extinction of the best types. How to counteract the dysgenic influence of progress is the great question which the Sphinx is propounding to civilized man. And the Sphinx will not wait indefinitely for an answer to her question."

Among the particular dangers that confront contemporary civilization are, from the standpoint of the biologist, modern warfare,

disease, the intermingling of human stocks without the exercise of selection, the comparative sterility of the well endowed, and the multiplication of defectives. In the early history of mankind war no doubt exerted at times a favorable influence, eliminating the less fit in the struggle for existence and offering to the better endowed individuals and races opportunities for expansion and development. Its dysgenic effect has been greatly increased by modern conditions. This was especially apparent in the Great War; for the warring peoples were in the main superior to those who took no part in the struggle, and the individuals who made up the armies, conscript or volunteer, were superior to the individuals who remained at home. Like war, disease has at times contributed to the improvement of the human stock by giving the virile the opportunity to supplant the weak. In modern civilized society, however, the weak and degenerate are enabled, through the development of philanthropy and medical science, to survive and to perpetuate themselves. Similarly the free intermingling of racial stocks is not devoid of danger to the inherent qualities of a people. Such a range of variation as springs from intermarriage in America today is an excellent basis for advance only on condition of the careful selection of desirable and the rigid elimination of undesirable types. Moreover, as Professor East and other biologists have indicated, the continued economic welfare of the civilized peoples depends on the regulation of the quality and quantity of human stock, no less than on the speeding up of the production and distribution of goods.

REFERENCES — Castle, W. E.: *Genetics and Eugenics* (3d ed.), 1924; Conklin, E. G.: *Heredity and Environment* (5th ed.), 1923; Darwin, L. (president) and others: *Problems in Eugenics, papers communicated to the First International Eugenics Congress*, London, 1912; Davenport, C. B.: *Heredity in Relation to Eugenics*, 1911; East, E. M.: *Mankind at the Crossroads*, 1923; Holmes, S. J.: *Studies in Evolution and Eugenics*, 1923; Morgan, T. H.: *Mechanism of Mendelian Heredity*, 1915, and *The Theory of the Gene*, 1926; Pearson, K.: *The Life and Letters of Francis Galton*, 1915–1924; Popenoe, H. and Johnson, R. H.: *Applied Eugenics*, 1918; Walter, H. E.: *Genetics: An Introduction to the Study of Heredity*, 1922.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. "As an agency making for progress, conscious selection must replace the blind forces of natural selection; and men must utilize all the knowledge acquired by studying the process of evolution in the past in order to promote moral and physical progress in the future." (Dr. Leonard Darwin in his presidential address at the First International Eugenics Congress, 1912). Explain and discuss this statement.
2. Distinguish between eugenics and euthenics.
3. Resolved: That the chief hope for the progress of mankind lies in the improvement of the biological inheritance of the species rather than in the improvement of its environmental conditions.
4. How far in your judgment was the decline of Greek and of Roman civilization due to the deterioration — through war, disease, etc. — of the Greek and Roman racial stock?
5. How are the dangers that threaten the biological inheritance of peoples like those of Great Britain and the United States to be met?
6. What are morons? Into what other classes are the feeble-minded divided? What percentage of feeble-mindedness is inherited? Discuss the view that the ranks of the criminals, paupers, prostitutes, etc., are recruited from the offspring of feeble-minded parents.

VI

FOREIGN AND DOMESTIC TRADE

Commerce presupposes a division of labor among the races and peoples of the world. The differentiation and multiplication of commodities which make their exchange possible rest on the racial, occupational, and environmental differences already touched upon in previous chapters. "Commerce exists," says Professor Russell Smith, the well-known authority on economic geography, "because individuals and peoples, having different goods, exchange their surplus to mutual advantage. This difference in the production of peoples arises from three main reasons — first, the difference in the peoples themselves; second, the difference in the stages of industrial development; and third, the difference in the resources of their respective lands." When the economic organization of a people becomes so complex that some men devote the greater part of their energies to the work of exchange, commerce becomes a special occupation, like agriculture, mining, and other forms of production. Thus in its growth it carries further the vocational differentiation on which it depends.

We may attach an exaggerated value to goods because they are recognized as the distinctive output of people racially different from ourselves. The very fact that they are the product of remote or alien races affects the esteem in which we hold such commodities as Cashmere shawls, Hindu ivory carvings, the wrought brass of Benares and Jaipur, Oriental silks and lacquer, French gloves and wines, Irish lace and linens, Indian blankets, baskets, quill ornaments, bead-work, and articles made of birchbark and buckskin. A suspicion that they are not genuine would rob them of a large part of their commercial value, no matter how serviceable they

might be. A Navaho blanket falls straightway into disfavor if there be discovered on it the brand of an eastern factory or the trade-mark of a Chicago mail-order establishment, while sparkling Burgundy from the Niagara peninsula and Swiss cheese made in Wisconsin do not command as high a price, at least in America, as the original European products. The judgment of the purchaser is particularly likely to be biased by such considerations as origin and mode of production in the case of articles that appeal to the esthetic sense. Here it is notoriously difficult to distinguish between the intrinsic value of an object and the extrinsic value which arises from associated ideas. A painting, a statue, or a piece of tapestry rises or falls in price according as the experts and connoisseurs — often with the greatest difficulty — decide in favor of or against its authenticity. The same sort of factitious worth may be ascribed to almost any of the commodities of races and peoples more or less highly differentiated from ourselves.

Commerce results from occupational specialization as well as from racial differentiation. "When each man has his trade and makes articles of only one kind, he will neither want all the things that he makes, nor make all the things that he wants." Exchange is the inevitable result. The like is true of peoples as of individuals. The countries of Europe and North America that are most highly developed industrially dispose of their surplus products — textile fabrics, iron and steel, and other manufactures — in the less highly developed countries of Asia, Africa, and South America, and receive in exchange cargoes of raw materials, and of foodstuffs for their teeming millions. Commercial progress, as we see in the case of Great Britain, for example, advances step by step with general industrial progress. As more and more countries overtake her in the development of manufactures, she must continue to gain rivals and lose customers, unless through further specialization among the various industrial peoples a profitable new allotment of the foreign field and at the same time a fresh basis of mutual trade can be reached.

Affording a more permanent opportunity for commerce than

racial differences, or than differences in industrial development, are the differences in natural resources which depend on such physical conditions as temperature, precipitation, the proximity of mountains and seas, the direction of currents and winds, the character of the soil, and the abundance and accessibility of iron, copper, coal, petroleum, and other minerals. A people apparently backward, from an economic point of view, may acquire within a few decades modern methods of manufacture, but only certain climates permit the production of such commodities as tea, coffee, sisal, and rubber. In spite of the activities of engineers, who have changed the face of nature by the construction of dams and irrigation canals, and in spite of the achievements of industrial chemists, who have found in beets a source of sugar to rival sugar-cane, who have rendered almost futile the cultivation of indigo plantations, and who are now pressing forward to fresh discoveries, commerce will probably be governed in the future, much as it has been in the past, by geographical conditions. As an eminent authority states, the introduction of new methods of production and distribution affords the means of permanently lightening human labor and satisfying the wants of an ever increasing proportion of the inhabitants of the world, but if there is any substantial benefit to mankind at large from these developments it will not be fully reaped until every kind of production is carried on in the place that has the greatest natural advantages for the purpose.

It was through the growth of the physical sciences and the consequent development of modern means of transportation, which will be treated more fully in a later chapter, that commercial intercourse was established between races and peoples inhabiting the most widely separated portions of the globe and that an exchange of commodities sufficient to meet the needs of the masses of mankind was effected. Accounts of the early stages in the advance of commerce in western Asia make prominent mention of feathers and silks, precious metals, stones, and woods, spices and ivory, and other articles of luxury. In the course of time the Egyptians were able to supplement the ordinary caravan traffic by the use in for-

eign trade of sea-going ships. After the decline of Egyptian and the destruction of Cretan civilization, the Phenicians gained commercial supremacy, carried on trade in the Black Sea, founded Carthage and other colonies, and pushed their way both north and south along the Atlantic coast. At the close of a long period of successful enterprise in the transportation of grain, furs, wool, fabrics, glass and metal ware, copper, tin, iron, and other ornamental and substantial commodities, these pioneer navigators were forced to give way before the rising power of Athens, Corinth, Carthage, and the Greek and Carthaginian colonies. When the Romans had destroyed Carthage, burned Corinth, overcome Athens, and brought under control the other commercial centers in the Mediterranean basin, they were able, though they contributed little to the development of commerce, to draw supplies from the remotest regions of the then known world. In the period subsequent to the fall of the Roman Empire in western Europe the Arabs held ascendancy in commerce till the time of the Crusades, when Venice and other medieval Italian cities entered into rivalry with them. With the coming into general use of the mariner's compass in the fourteenth century the exchange of surplus products between widely separated peoples was greatly facilitated. Navigators ventured to sail further and further from the seaboard; new trade routes were established; as commercial centers Venice and Genoa, Danzig and Lübeck, became less important than Lisbon, London, Amsterdam, and other western ports. In its effect on foreign trade nothing comparable with the introduction of the compass occurred until the application of steam to navigation at the beginning of the nineteenth century. This was decisive in making trade truly international. The subsequent invention of the screw propeller, the substitution of iron for wood and steel for iron in the construction of ships, the improvement of the marine engine, the introduction of the steam-turbine, the extending use and the constantly increasing size of steamships, rendered transoceanic trade more profitable, and encouraged the division of labor between race and race, continent and continent, zone and zone.

Consequently, the commercial and industrial interdependence of races and peoples (with the growing consciousness of the essential solidarity of mankind) is one of the outstanding features of contemporary civilization. Examples are almost superfluous. Great Britain, with its elaborate system of industries, must export the surplus products of its factories and coal mines, while it is dependent on such imported foodstuffs and raw materials as meat, cereals, fruits, tea, coffee, sugar, lumber, fibers, gums, iron, copper, and petroleum. Newfoundland, with a much more simple industrial organization, able to dispense with all manufacturing activities except such as are immediately connected with its natural resources (lumber, pulp-wood, seal-oil, rope, nets, etc.), must obtain from abroad, in exchange for the products of its forests, mines, and fisheries, whatever finished products it requires. It is today sufficiently known that the most highly civilized countries of the world are largely dependent for their supplies of cultivated rubber on the plantations of the Straits Settlements, Ceylon, Borneo, Java, Sumatra, and other parts of the British and Dutch East Indies. More than seventy per cent of the world's supply of coffee is furnished by Brazil. The Southern States provide about sixty per cent of the raw cotton. We still rely on northern Chile and the countries on its borders as the chief source of our commercial nitrates. There is a continued demand for the potash of Germany and France notwithstanding the extensive reserve deposits in Russia and other countries. Canada holds what amounts almost to a monopoly in the output of nickel and asbestos. Central America occupies the supreme place in the production of certain tropical woods and fruits. The tropics in general export annually characteristic products valued at three or four billion dollars. In addition to rubber, sugar, woods, and fruits, mention might here be made of jute and other indispensable fibers. The value of the manufactured goods entering into the total foreign trade of the world is about twice that of these tropical products. The grains and meats and minerals of the industrially less developed parts of the temperate zones should, likewise, not be overlooked in a survey of the chief

items of the international exchange of surplus commodities. With the development of physical and natural science, and the advance of navigation, commerce has broken through all local and national boundaries and united the various peoples and races of the world in one great economic organization.

The territorial division of labor within the confines of a single country may be observed to advantage in connection with the domestic trade of the United States. New England exchanges its textiles, shoes, hardware, machinery, fish, and other products, for the cotton, wool, hides, iron, flour, meat, butter, cheese, and other raw materials and foodstuffs of the South and West. The North Atlantic States in general furnish about one-half of the manufactured goods of the country but only about one-tenth of the foodstuffs. Its accessibility and its consequent early settlement by Europeans, the excellence of its harbors, the wealth of its fisheries, and the abundance of its water-power, hastened its commercial and industrial development and gave it supremacy over all other parts of the United States with populations less dense and vocational systems less complex. In addition to raw cotton, the Cotton Belt furnishes large quantities of cotton cloth, of lumber, and of iron. The Allegheny Plateau exports coal, iron and steel, glass, and wood. The Corn Belt produces immense surpluses of grain and meat. From the Great Plains come cattle, sheep, wool, beet-sugar, and potatoes. Other regions are famous for their truck crops, plums, prunes, peaches, raisins, and citrous fruits, for petroleum, gold, silver, lead, and other minerals. The Upper Lake Region sends out its supplies of iron ore, copper, and lumber; while the Lower Lake Region contributes agricultural machinery, automobiles, canned meats, apples, butter, cheese, and other commodities. In fine, the domestic trade of the United States — in manufactured goods, in agricultural products, in furs and fish, in the output of the mines and oil wells — amounts to about ten times as much in value as its total foreign trade.

In the development of the internal trade of North America, the Great Lakes, comparable to the Mediterranean Sea in making

accessible the agricultural and mineral resources of vast areas remote from the Atlantic seaboard, have played a notable part. The completion in 1825 of the Erie Canal, which insured cheap transportation from Buffalo to New York, brought about a revolution in the domestic trade of the United States. The time of the haul between the two cities was reduced by about sixty per cent, and the cost by about ninety. The number of steamboats on the Great Lakes rapidly increased. A regular steamer service, established between Buffalo, Cleveland, and Detroit in 1826, was extended to Lake Michigan in 1830. Chicago and other places, soon to become important assembling and distributing points, now appeared on the map for the first time. When the era of railway construction began, the earlier distribution of the population along the waterways determined the course of the new trade routes. Railway lines sought the banks of the Hudson and the Mohawk, ran parallel with the canals and the Great Lakes, or converged on and diverged from the chief ports. Chicago, favorably situated on that part of the trade route which protrudes furthest into the Corn Belt, became the greatest food-distributing center in the world. The trans-continental railway lines of the north that touched ports on Lake Superior could, like the Southern Pacific, offer to shippers the benefit of cheap water transport over the eastern stages of the Atlantic-Pacific route.

The improvement of the waterways is rightly considered one of the chief means of advancing the trade of North America. The reconstruction of the Erie and the Welland Canals, for example, must prove stimulating to the domestic as well as to the foreign trade of Canada and the United States. The projected development of the St. Lawrence route through the coöperation of the governments of these countries — bound together by many economic and social ties and the tradition of a hundred years of peace — promises to be a particularly significant enterprise. The International Joint Commission submitted its report on this project in 1922. In June, 1924, the Honorable Herbert C. Hoover, then chair-

man of the United States St. Lawrence Commission, spoke at Toronto substantially as follows: "The greatest economic objective of the two countries is to improve the standard of living of the people. The ascent or descent of this standard is, in fact, the index of progress. I believe that in the proposed development lies the greatest opportunity of such improvement. The two nations have many problems in common. The solution of the question before us will establish another international bond. If we can carry on this undertaking jointly, we shall have made a contribution to civilization the influence of which will extend far into the future."

In the history of the international waterways and of the exchange of commodities between the United States and Canada we have an indication of what can be accomplished through the friendly coöperation of nations in the promotion of trade. The freight carried on the Detroit River is three times greater by weight than that carried on the Suez Canal. In spite of the continued existence of high tariffs Canada in the twelve months ending December 31, 1927, exported to the United States goods valued at four hundred and seventy-five million dollars and imported from the same country goods valued at eight hundred and thirty-six million. These exports and imports amount to more than fifty per cent of Canada's total foreign trade. Though commerce is said to be necessarily competitive and to involve a system of retaliatory schedules, the spirit shown on the boundary line between the United States and Canada anticipated in some respects the new era of international coöperation in trade which now exists throughout the civilized world to a degree undreamed of before the Great War.

REFERENCES — Brunhes, J.: "Human Geography" (chap. ii of *The History and Prospects of the Social Sciences*, edited by H. E. Barnes, 1925); Chisholm, G. G.: *Handbook of Commercial Geography*, 1922; Day, C.: *History of Commerce*, 2d ed., 1922; Huntington, E. and Cushing, S. W.: *Principles of Human Geography*, 1920; Pepper, C. M.: *American Foreign Trade*, 1919; Smith, J. R.: *North America* 1925.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. "Commerce is a division of labor among the peoples of the world." Criticize this definition or description, and distinguish between commerce and trade.
2. What is the difference between barter and sale? Sketch the history of money, and show how foreign and domestic trade has been facilitated by the development of media of exchange.
3. Write an essay on the effect of commerce on the growth of the sense of unity among the peoples of the earth.
4. Discuss the view that commerce will be governed in the future, much as it has been in the past, by geographical conditions.
5. What circumstances have contributed most to the commercial prosperity of (a) New York, and (b) Chicago?
6. Compare the commercial prospects of North Carolina, Louisiana, and California.
7. Resolved: That it would be to the advantage of both Canada and the United States to undertake jointly the opening up of the St. Lawrence-Great Lakes route to sea-going vessels.
8. What bearing have the principles enunciated in this chapter on the present crisis (September, 1928) in the American cotton trade?

VII

WAR AND THE ECONOMIC STRUGGLE

The desire for commercial privilege and for freedom from commercial restraint is, according to a distinguished English economist, the primary cause of war. There is no lack, it must be conceded, of secondary causes. Crusades and jehads, wars in support of this or that faith, bear witness that one of these causes has been, both in medieval and modern times, the opposition of religious beliefs. Dynastic ambitions, as is well known, have furnished another frequent occasion of hostility. Further motives for war are found in the assertion of national aspirations, the infringement of national honor, the desire of revenge for some slight or wrong, the unification of social groups, the establishment of independence or suzerainty, the need on the part of rulers or factions of diverting public attention from the problems of domestic politics, the assertion of the rights of the masses against the claims of monarchs, the support of rebels and revolutionaries by neighboring peoples, the affirmation of neutrality, the maintenance of alliances, the dissemination of culture and of political doctrines, intolerance of strange speech, manners, and mode of life, along with ridicule, hatred, and distrust. Some of these motives have been strengthened by the existence of a professional body of fighting men, representatives of one of the oldest and most conspicuous of those vocational groups we are passing under review. Their appropriation of the results of the labors of men like Dalton and Faraday, Pasteur and Lister, does not place the responsibility for war on the physical and natural sciences. The chief indictment lies not against organized knowledge but against organized greed. Of all the causes of war economic rivalry is surely the most potent. The aggressor may proceed on

false assumptions regarding the advantages of conquest, and yet the root of modern war seems to lie in economic conditions.

The competition of densely populated, highly developed industrial states for colonies, markets, raw materials, and foodstuffs, stimulates in them the imperialistic spirit, embroils them with the less advanced peoples with whom they undertake to establish relations, and is a cause of hostility, as we shall presently see, among these states themselves. Conflicting colonial policies and ambitions, attempts at territorial expansion and disputes regarding frontiers, friction arising from emigration and immigration, efforts to gain control of straits, canals, and other trade routes, claims to the command of strategic points, naval bases, coaling stations, harbors, access to the sea — all these are familiar as aspects of that economic struggle which is asserted to be the fundamental cause of war among highly civilized peoples today.

The earlier stages in the development of civilization might also serve to illustrate the causal relations between war and economic conditions. Primitive tribes that gain a living through the wanton destruction of natural resources may be kept in a perpetual state of war concerning the boundaries of their hunting grounds or fishing stations. A few weeks of drought may cause a pastoral people to provoke hostility by encroaching on alien territory. Agricultural peoples, in turn, are in frequent need of outlet for their surplus populations. In the earliest Greek literature war is represented as waged for lands, and herds, and slaves, and plunder of various kinds. At a later period Plato, comparing war with the other ancient vocations of man, says that it, like hunting and trade and unlike agriculture, is acquisitive and not productive. The economic conditions of Sparta and Athens, the one an agricultural and the other an industrial and commercial state, afford an important clue to the military history of Greece. For the Romans, war went hand in hand with spoliation. Holding in contempt commerce and productive industry, they preyed upon and enslaved the peoples they subdued by force of arms. Reference has already been made to the destruction of Carthage and the conquest of Greece. The essential

cause of Rome's decline — the signal for renewed wars — was that for generation after generation her consumption had exceeded her production. The populace of the capital had been corrupted by the systematic distribution of doles, and Italian agriculture had been ruined by large estates and the use of slave labor. The final catastrophe, the invasion of the Empire by the barbarians, is likewise explicable on economic grounds. Interspersed with the historians' accounts of looting and plundering hordes we find mention of the reiterated prayer for land. For example, it was as suppliants that the Visigoths, driven from their own country by the needy Mongolian Huns, first presented themselves on the frontiers of the Roman provinces. Even their later wanderings under Alaric, now intercepting cargoes of grain at the Piræus, now cutting Rome off at Ostia from her Egyptian supplies, and, finally, moving south toward the wheat fields of Sicily, suggest that the really dominant motive of these Teutonic barbarians was hunger rather than mere *wanderlust* or *kriegslust*.

Turning now to modern history, we find that soon after the middle of the eighteenth century the struggle between the French and British for the commercial and industrial supremacy of the world brought about war, at first without formal declaration, in India and America. In the latter, actual hostilities began in 1754 on the site of the present city of Pittsburgh, George Washington having previously recognized in the junction of the Allegheny and the Monongahela a strategic position of the first importance from the military as well as from the commercial point of view. The year following Braddock's defeat marked the beginning of the Seven Years' War and the appointment of William Pitt as Secretary of State. No war, says Green, the historian of the English people, has had greater effects on the history of the world. Pitt, grandson of a wealthy governor of Madras, representing as the great commoner in Parliament the prosperous middle classes produced by the progress of commerce and industry, was the presiding genius of this great struggle for economic leadership. His eloquence aroused the British to a sense of the importance of the war, and his knowledge

of human nature enabled him to select for promotion officers such as Wolfe, Amherst, and Forbes, imbued with his own enthusiasm. Like Lincoln, he had an eye for the larger aspects of strategy and he never for a moment lost sight of the scope and significance of the war he was directing. He supported Frederick the Great against France on the continent of Europe; and, during his ministry, Robert Clive, the hero of the struggle in India, who had been a clerk in the service of the East India Company, laid the foundations by the battle of Plassey (1757) of the British Empire in the East. In the New World the occupation of the site of Fort Duquesne, the capture of Quebec, and other military successes, carried with them the momentous decision that the commerce of the St. Lawrence and the Mississippi, the settlement of the West, and the civilization of the American continent north of the Mexican border should rest ultimately in the hands of the English-speaking peoples.

The problem of over-population, as already implied, bears an important relation to colonial expansion, the encroachment of one state on the territory of another, and other menacing phases of the economic struggle. Italy, for example, with a population of 39,989,385¹ and an area of only 119,242 square miles, has been forced to seek an outlet for its surplus millions, especially as the lack of coal and iron has set limits on its industrial development. For decades it has lost annually from one-half to three-quarters of a million of its citizens through emigration to foreign countries—nothing short of a tragedy from the national point of view. It fought an unsuccessful war with Abyssinia as a result of its endeavors to develop its colonial possessions on the Red Sea. It had the chagrin of seeing its surplus population migrating to the French colonies in North Africa. In 1911 it went to war with Turkey in order to gain possession of Tripoli, the peaceful penetration of which territory by Italians had been checked by Turkish officials. The subsequent annexation of Tripoli some writers have condemned as an act of unscrupulous aggression, while others re-

¹ Now estimated at 42,000,000.

gard it as a patriotic action dictated by necessity. Only those who are willing to give sympathetic consideration to the facts concerning over-population can hope to understand the various aspects of territorial expansion and the wars arising therefrom. Italy has an average of 335.4 persons to the square mile, and its present population would, at its normal rate of natural increase, double in 65 years. Germany has 345.0 persons to the square mile, and its population would, by natural increase, double in less than 60 years. The Netherlands has an average of 561.6 persons to the square mile; Belgium 670.0; England, 701.3; the United States, 35.5; Canada, 2.4; and Australia, 2.1. The population of the Japanese Empire is over 80 millions; of the eighteen provinces of the Chinese Republic, 375; of India (including the Native States), 318. Where can the highly civilized countries of Europe find an outlet for their surplus population? Cut off from South America by the Monroe Doctrine, they turn greedily to Africa, Mesopotamia, and to other of the less densely populated parts of the Eastern Hemisphere.

A glance at Anglo-Indian commerce will serve to explain the apparent value of colonial possessions as sources of foodstuffs and raw material and as markets for finished products. At the present time Great Britain obtains from India, which is first and foremost an agricultural country, such imports as rice, wheat, spices, tea, coffee, linseed, raw silk and cotton, jute and other vegetable fibers. In exchange Great Britain exports, to this most important of her colonial possessions, a great variety of manufactured goods — woolens and cottons, railway plant and rolling stock, etc. That the old home industries of India have not been wholly routed by the output of European factories is proved by the continued presence in the markets of the world of Hindu leather, gunny cloth, carpets, silk fabrics, embroidery, wrought metal, and other evidences of Oriental craftsmanship. Through the efforts of politicians, the ancient methods of spinning and weaving cotton have been revived and stimulated among the natives of the peninsula. So far, however, the manufacturers of Great Britain have been able to market their goods at a profit. Some British statesmen naturally fear that

to grant complete autonomy to India at the present time would jeopardize their country's interests, and play into the hands of her commercial and political rivals.

Germany, France, the United States, Japan, and other manufacturing countries, have, like Great Britain, need of the markets, raw materials, and foodstuffs of countries less developed industrially than themselves. With the exception of the United States the countries named have pressing need of imported foodstuffs. Japan imports wheat, flour, rice, and sugar in considerable quantities. France, with a larger percentage of arable land and a sparser population than Japan, has also to rely on imported cereals. In the year preceding the Great War Germany imported wheat, barley, and other foodstuffs valued at many hundred million dollars. Germany and France have to import the raw silk, cotton, and wool used in the manufacture of textiles. Germany imports iron and lumber; France imports coal, hides, and furs. Among the many other kinds of imported raw materials demanded by civilized countries, petroleum and rubber are of particular importance as regards their bearing on the retention and extension of colonies and on contemporary problems of international politics.

In the anxious years preceding the Great War the British looked upon the Germans as dangerous competitors in commerce and industry. Germany's devotion to science, her well-organized system of technical education, and the thoroughness of her commercial and industrial methods, were good grounds of alarm for those interested in the continuance of British supremacy and prestige. Her successes were not merely material, but she had carried into the pursuit of the fine arts and the study of literature and philosophy the diligence and enthusiasm manifested in the physical and natural sciences and their applications. As one English-speaking writer has said, Germany threatened to clamber above us in the scale of civilization. Moreover, after having developed the most powerful army in the history of the world, she turned her attention to the construction of a great navy to challenge Britain's ascendancy on the seas, and to protect Germany's splendid merchant

marine. Little that science and technology might suggest would remain undone. The Emperor left neither friend nor foe in doubt regarding German naval and commercial aspirations. Neptune's trident, he exclaimed, must be grasped by Germany.

While the British feared the Germans as menacing their control of commerce and industry, the Germans hated the rivals who stood in the way of their development, and they could not regard with equanimity Britain's extensive empire, her rich colonial possessions, and her control of the sea routes. Germany's colonies had been acquired and held on sufferance; German imports and exports were at the mercy of the British navy, a fact that an English statesman of the imperialistic type, like Joseph Chamberlain, was not slow to emphasize on occasion. There was scarcely a strategic point on the sea routes of the world that Britain could not command. Moreover, as Prince von Bülow indicated, internal politics threatened the successful maintenance of Germany's naval rivalry of Britain; for the Social Democrats were steadily gaining power in the Reichstag and their opposition to expenditures for the development of the German navy (as well as for the support of the army) made risky the foreign policy of the Emperor and his more aggressive advisers. By 1914 many patriotic Germans felt that a war in support of their commercial aspirations was inevitable and that, should they hesitate, so favorable an opportunity might never occur again.

Mixed with the French desire of revenge for the disaster of 1870-1871 was the consciousness of the loss of the mines of Lorraine, from which Germany at the beginning of the present century was obtaining seventy-five per cent of her supply of iron ore. At the same time the Germans had awakened to the fact that by the settlement of 1871 the best ore deposits along the frontier had by mistake been left in the hands of the French. Other economic causes of disagreement arose in connection with colonial expansion. Western Morocco, in which Germany, France, and England had interests, became the subject of bitter contention. Its possession was of importance on account of its deposits of iron and other

minerals, as well as of its position with reference to some of the main trade routes. In 1904 Britain withdrew from Morocco as a concession, not altogether disinterested, to the claims of France. The German Emperor, in rather dramatic fashion, visited Tangier and gave the Sultan of Morocco assurances of support against the French. One incident led to another, until France, supported by British diplomacy, established her command over the territory in question, and the Germans, in lieu of their claims, accepted a part of French Kongo. After these events war between Germany and her commercial rivals was merely a matter of time.

By peaceful penetration the Germans had gradually come to control a large part of Russian industry and commerce. Von Bülow's policy had been pressure toward the east (*Drang nach Osten*) and the eventual territorial expansion of Germany at the expense of the Poles and the Russians proper. That policy, however, broke down in face of the extreme fecundity of the Polish people. Von Bülow himself came to recognize that Germany must look more to the south, finding her place in the sun supported by the prestige of a powerful army and navy.

During the Great War the Germans were accused of having cherished the dream of an empire extending from the North Sea to the Persian Gulf and provided with railway lines connecting Hamburg, Berlin, Vienna, Belgrade, Constantinople, Bagdad, and Basra. These lines and their ramifications, it was alleged, were to render available to the Germanic peoples of Middle Europe such commodities as iron ore, manganese, petroleum, flax, hemp, cotton, and wheat. The Tigris-Euphrates Valley was to supply an abundance of grain crops and to afford opportunities for colonization. Over-population was to be relieved, and markets, foodstuffs, and raw materials were to be secured by this comprehensive plan. Its strategic advantages were as important from a purely military as from an economic point of view. India, the star colony of Germany's great trade rival, might be threatened from the northwest; the Suez Canal and Egypt would be within striking distance; and the importance of Britain's command of the seas would

be considerably diminished. For the successful prosecution of this plan it was essential that the way between Vienna and Constantinople should not be blocked by an independent and defiant Serbia (supported by the power of Russia). It seemed significant that here there occurred the crisis that led directly to the Great War.

Can the social sciences, which are able to offer plausible explanations of war, guide us in the discovery of means of preventing it? What may we hope from a science of economics that prefers the welfare of man to the wealth of nations, or from a political science that puts humanity above all kingdoms and empires? What may we expect from the development of jurisprudence?

REFERENCES — Bakeless, J.: *The Economic Causes of Modern War*, 1921; Bülow, B. v. (Prince): *Imperial Germany*, 1913; Hirst, F. W.: *The Political Economy of War*, 1915; Hobson, J. A.: *The War in South Africa*, 1900; Marriott, J. A. R.: *Economics and Ethics*, 1923; Robinson, E. V. D.: "War and Economics in History and in Theory," *Political Science Quarterly*, xv, 1900.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That at the present stage in the development of civilization the economic causes of war outweigh in importance all other causes combined.
2. Explain and discuss the statement: "The chief indictment lies not against organized knowledge but against organized greed."
3. What in your judgment were the chief causes of the Great War other than the economic causes?
4. Write an essay of three or four thousand words on "The Imperialistic Spirit," describing its manifestations in Great Britain, Germany, the United States, and other highly civilized countries, and showing its relation to commercial and colonial expansion.
5. (a) Would British commercial interests suffer if India and Egypt were made completely autonomous? (b) Would the commercial interests of the United States suffer if it ceased to exert political influence over the Philippines and the countries of Central and South America?

VIII

THE DEVELOPMENT OF INTERNATIONAL LAW

Many of the recent popular treatises on general history and the progress of civilization all but ignore the development of law, resting content with a few perfunctory sentences concerning two or three of the most famous legal codes. The author of one work of this class undertakes, indeed, to justify in a footnote his failure to emphasize the fact that the supreme contribution of Rome to the heritage of mankind was the idea of a universal society founded on law, and his failure to attach any great importance to the codification of the Roman Law in the reign of the Emperor Justinian. It seems to him that our present laws are impracticable, out of harmony with the spirit of the times, and based on false assumptions concerning human relationships. He ventures to prophesy that eventually the whole theory and practice of law will be recast in the light of social psychology and brought into harmony with a system of moral and intellectual education and with a scientific conception of society as one developing organism. All these criticisms and aspirations, however, have been anticipated in the voluminous writings of the recognized exponents of modern jurisprudence. They hold that our laws have come to us as a product of the civilizations of the past and that they must be subjected to revision and modification in order to adapt them to the civilization of the present. Ancient precepts must be applied with discretion. Account must be taken of the purposes and ethical ideals of modern society, of the growing complexity of the division of labor, and of the economic interdependence of the individuals and groups that compose our highly developed industrial communities. In short, the foremost jurists of the twentieth century are bringing to

bear on the science of law the results of economics, sociology, political science, ethics, psychology, social education, and the impartial study of the history of civilization.

It was in the cradle of commerce, according to David Jayne Hill, that international law awoke to consciousness. Whether we associate this awakening with the maritime codes of the Middle Ages or with the writings of Grotius, who in the opening years of the seventeenth century defended Dutch traders in the East against the pretensions of the Spaniards and Portuguese, we are compelled to trace the definite conception of a general community of peoples (*civitas gentium*) and of a law of nature and nations to the practice and theory of Roman prætors and jurisconsults. It is true that the Greek city-states had acknowledged certain obligations toward one another — the common laws of the Hellenes — and had accepted certain restrictions in the waging of war; but it is to the Romans and their prolonged experience as empire builders that we are indebted for the definite formulation of the laws of diplomatic intercourse and, above all, of the principles of *jus gentium* and *jus naturale*, around the interpretation of which the early development of international law took shape. Under *jus gentium* litigation between foreigner and foreigner, and foreigner and Roman was conducted, and the administration of justice on general principles was finally assured. For this law rested on the universal sense of right and wrong, on the accord of mankind in general, of man as a social being, rather than on the agreement of particular nations or peoples. By some of the Roman writers on jurisprudence *jus naturale*, described as something established among all men by natural reason, was identified with *jus gentium*. The Stoic teaching that a virtuous life is one in harmony with nature, though it is doubtless a rather obscure doctrine, lent to *jus naturale* an almost religious sanction. In the time of Justinian it was held by jurists that in animals, as well as in men, could be observed the manifestation of *jus naturale*. A hundred years later — that is, at the beginning of the seventh century — *jus gentium* emerges as that part of human regulation that deals authoritatively with such matters

as the sanctity of diplomatic intercourse, war, truces, treaties of peace, the occupation of land by barbarians, enslavement, and the prohibition of marriage between persons of diverse nationality. This interpretation of *jus gentium* reflects the struggle between the Latinized peoples within the boundaries of the Empire and the intruding Teutonic tribes with whom it was their inevitable destiny to blend.

Among the best known of the maritime codes of medieval Europe contributing to the development of international law were the *Consolato del Mare* (Regulation of the Sea), the *Jugemens d'Oléron*, and the *Laws of Wisby*. These codes, though they were affected by Roman Law as represented by the *Corpus Juris* of Justinian, were not promulgated by any sovereign or enacted by any legislative body. They were collections of rules and regulations embodying the customs of the sea followed for generations by merchants, and the owners and masters of ships, in the Mediterranean Sea, the North Atlantic Ocean, the North Sea, the Baltic, and other European waters. It is difficult to give a summary account of them, because they arose spontaneously in response to the needs of shippers and carriers, of belligerents and neutrals, and because they were again and again modified to meet the requirements of particular times and places. The *Consolato del Mare* gave law to the merchants and seamen of the Mediterranean from the dawn of modern international commerce. In printed form this code appeared at Barcelona before the end of the fifteenth century, but it had undoubtedly circulated in manuscript in the ports of Italy and Spain during a very long period. It dealt with such matters as contracts, personal rights and responsibilities, wages, freight charges, collisions, jettison, salvage, piracy, and the claims of belligerents and neutrals. Neutral goods were declared exempt from seizure on enemy ships, but enemy goods might be seized on neutral ships. Free ships did not guarantee the freedom of goods. The *Jugemens d'Oléron*, a maritime code taking its name from an island off the west coast of France, was less elaborate than the *Consolato del Mare*. Adopted from the French by the English and

the Spaniards, it exercised control over commerce in the North Atlantic before the close of the thirteenth century. *The Laws of Wisby*, differing little from the *Jugemens d'Oléron* and named from a port on the island of Gothland in the Baltic, became the accepted maritime code of the Hanseatic League.

Of the immediate precursors of Grotius, the father of international jurisprudence, two were jurists and two were theologians. The former were incited to the study of international relations by the apparent incompatibility of war and legality; while the latter, stimulated by the disruption of Christendom through the Protestant Reformation and by the failure of the Emperor Charles V to realize the dream of a Universal Monarchy, rose to the conception of an Association of States owing allegiance to no extraneous authority. Ayala, Judge Advocate of the Spanish Army in the Netherlands, maintained in 1582, in opposition to the common opinion, that war was not irreconcilable with the spirit of law. Under the law of nature, according to him, all men enjoyed liberty, but the law of nations might as regards liberty, as well as other human relations, override natural law. Albericus Gentilis, professor of civil law at Oxford, held that all questions relating to the justice of war must be referred to natural reason and the consent of all nations. As an Italian Protestant he was interested in 1588, the year of the Spanish Armada, in determining to what authority English Catholics owed allegiance. Vasquez, born in the kingdom of Navarre before it was divided between France and Spain, was a theologian and an earlier forerunner of Grotius than Gentilis or Ayala. He taught in 1564 that a harmonious association of civilized states might be established through the principle of *jus naturale et gentium* and without the dominance of the Empire or the Papacy. In like spirit Suarez, professor of theology of Coimbra, Portugal, proclaimed in 1612 the existence of a law between nation and nation founded on the necessary association of states. The human race, he maintained, although divided into various peoples and kingdoms, always preserves a certain unity, not merely as a species but also as a quasi-political and

moral entity, of which we are made aware by the natural injunction of mutual love and pity which is extended to all, to foreigners and to members of any nation whatsoever. Although each state may be perfect and independent in itself, yet viewed in relation to the human race it is seen to form a part in some measure of that larger unit.

Hugo Grotius, 1583-1645, jurist, diplomat, historian, poet, and theologian, was well fitted for the task of giving systematic statement to the advances made in the practice and theory of international law at the beginning of the seventeenth century and of awakening the consciences of the rulers of Europe to the need of further advances. He was born at Delft of a family of distinguished scholars and men of affairs. His uncle was professor of law in the University of Leyden. This institution Grotius himself entered at the age of twelve, and here he was directed in his studies by Joseph Scaliger, one of the greatest of European scholars. After accompanying a special embassy to the court of Henri IV, Grotius was called to the bar at the age of seventeen. As early as 1604 he composed a manuscript essay *De Jure Prædæ*, the leading idea of which, suggested in the course of his legal practice, was later elaborated in his famous works on international law. He was stirred to the publication of *Mare Liberum* in 1609 by the hostilities between the forces of the newly formed Dutch East India Company and the Portuguese, supported by their Spanish overlords, who, in the negotiations which had followed actual fighting in the Malacca Strait, sought to force the Republic to relinquish all its commercial enterprises in the East Indies. But it was only in 1625, after the Thirty Years' War had been in progress for seven years, that Grotius, moved to write by sorrow and indignation over the horrors of that devastating conflict, brought out his masterpiece, *De Jure Belli ac Pacis*.

Following Vasquez, he cast aside the idea of a world dominion, either imperial or ecclesiastical, but he embraced, as did his contemporary Suarez, the idea of a society of independent and civilized states, each preserving its sovereignty at the same time

that it, for the accomplishment of common purposes, enters into coöperation with associated states. "As that citizen is no fool who obeys the law of his city, though out of reverence to that law he must and ought to pass by some things that might be advantageous to himself: so neither is that nation foolish, which for the sake of its own particular advantage, will not break in upon the laws common to all nations; for the same reason holds good in both. For as he, who violates the laws of his country for the sake of some present advantage to himself, destroys that which is made for the perpetual securing of what himself or his posterity shall be able to acquire; so, that people which violates the law of nature and nations breaks down the bulwark of its future happiness and tranquillity." Grotius recognized not only a natural law of nations but a voluntary law of nations, implicit in customs and usages and explicit in treaties, compacts, and other conventional forms.

It would be a great exaggeration to say that the *De Jure Belli ac Pacis* treated its subject so adequately that there remained nothing further to be said. Rather, it called into being a series of works on the most important aspects of international law, their authors influenced in one direction or another by the mind of the master. For example, Pufendorf (*De Jure Naturæ et Gentium*, 1672) undertook to develop a system of international jurisprudence in accordance with the dictates of natural reason without regard to actual customs and regulations. Leibnitz, philosopher and courtier, placed emphasis on treaties and diplomatic documents as sources of public law. Bynkershoek, interested as a practical lawyer in such questions as the range of territorial waters (the three-mile limit), identified the law of nations not with the law of nature, to be discovered in the works of poets and orators, but with law between nation and nation — *jus inter gentes*. For the philosopher Christian Wolff, at one time professor of international law at Halle, each state, made up of associated citizens, is itself a member of an Association of States, or *civitas maxima*. The great Swiss publicist Vattel succeeded in reconciling international law deduced from general ideas with international law implicit in customs and

enactments. He drew his main principles from the writings of Wolff, but displayed considerable originality on the practical side. Vattel's volume — on the law of peoples, or principles of natural law applied to the conduct and affairs of nations and sovereigns — was published at the critical time of the Seven Years' War.

The influence of Grotius can be traced in the history of diplomacy as well as in the history of legal literature. The Association, or Society, of States — secular and free from the domination of the Holy Roman Empire — gained definite recognition, three years after the death of Grotius, in the Peace of Westphalia. This international agreement brought to an end the Thirty Years' War, the abominable cruelty and wastefulness of which he had so deeply deplored. The Treaty of Utrecht, 1713, at the close of a war fought to check the ambitions of Louis XIV, not only brought peace to the French, Dutch, and English, but dealt in a constructive way with the relations of war to commerce, and sought to prevent any nation from aspiring thenceforth to political ascendancy. The Treaty of Paris, signed in 1856 after the Crimean War, admitted Turkey to the *concert* of Europe, as the union or concord of the associated nations was called, and to the advantages and responsibilities of international law. Moreover, the Declaration of Paris, drawn up at the same time by the plenipotentiaries of seven of the most highly civilized states in the world, made a decisive advance in the formulation of international law by establishing certain definite regulations. Privateering was abolished; the nature of a true blockade was defined; and, with some modification, the rule of the *Consolato del Mare* touching the immunity from seizure of neutral goods on enemy ships was reaffirmed. As crisis followed crisis in the history of modern civilization, it became more and more apparent that war tends gradually to develop its own antitoxins, and that increased intercourse among the nations is the occasion of interdependence and mutual understanding no less than of hostile collision. The Treaty of Washington, negotiated in 1871 between the two great English-speaking peoples, was designed to obviate all possible causes of subsequent friction and to arrive at a rational

settlement of a wrong done to the United States by Britain during the American Civil War. It succeeded in fixing the southern boundary of the Canadian Northwest, in bringing about an agreement in reference to the St. Lawrence and Great Lakes trade route, and in paving the way for the adjustment of the "Alabama" Claims by an international Tribunal of Arbitration.

During the last sixty years international conferences and conventions in the capitals of Switzerland, Russia, Belgium, the Netherlands, and Great Britain have dealt with a great variety of subjects of world-wide importance, such as the care of the wounded on the field of battle, the treatment of prisoners of war and non-combatants, the prohibition of expanding bullets and poison gases, the restriction of the use of aerial and submarine craft, and the resort to arbitration. These international assemblies have not confined their attention to the amelioration or prevention of war but have taken under consideration the control of the sale of narcotics, general sanitation and hygiene, the suppression of the slave trade, the adoption of monetary standards and a uniform system of weights and measures, and other matters concerning human welfare. After the first meeting of the League of Nations in 1920 it was found that this new international organization greatly expedited the work that had been undertaken by these various conferences and conventions, while it exerted a favorable influence on such questions as the reform of the calendar, the conditions of the employment of women and children, and the rights of seamen in the service of the merchant marine. Most important of all, the codification of international law, notably advanced by the Hague Conferences of 1899 and 1907, entered on a new era of progress with the establishment, under the League of Nations, of the Permanent Court of International Justice.

REFERENCES — Baker, P. J.: "The Codification of International Law," *The British Year Book of International Law*, 1924; Birkenhead, the Earl of: *International Law*, 6th ed., 1927; Fachiri, A. P.: *The Permanent Court of International Justice*, 1925; Grotius, H.: *The Rights of War and Peace* (translated by A. C. Campbell, 1901); Hill, D. J.: *A History of European Diplomacy in the International*

Development of Europe, 1911; Hudson, M. O.: *Prospect for International Law in the Twentieth Century*, 1925; Moore, J. B.: *International Law and Some Current Illusions*, 1924; Pound, R.: "Jurisprudence" (chap. ix, *The History and Prospects of the Social Sciences*, edited by H. E. Barnes), 1925; Walker, T. A.: *A History of the Law of Nations*, 1899.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the League of Nations, under its present auspices and as at present constituted, tends to promote a spirit of international democracy.
2. Write a brief essay on the importance of the codification of international law, making special reference to the activities of the Permanent Court of International Justice.
3. Show that the conception of the Law of Nations developed with the growth of the Roman Empire. Write notes on the great Roman jurists (Gaius, Papinian, Ulpian, Paulus, etc.), giving their places of birth. Did the Romans gain distinction in any branch of science except jurisprudence?
4. Compare the Renaissance idea of an Association of States with (a) the idea of the unity of the Roman Empire, and (b) the idea of the unity of Christendom.
5. How did Grotius attempt to show the reasonableness of accepting a system of international law? Do you find his argument convincing?
6. Explain and discuss the view that war tends to develop its own antitoxins.
7. What was the social basis of the early maritime codes? Show that these codes reflect the history of commerce.

IX

LAW AND JUSTICE

It is a well-known principle of Greek political theory and of Roman jurisprudence that there is a necessary association between law and human society; wherever men are gathered together there is law — *ubi societas, ibi jus*. Back of the assumption of Grotius and Suarez that the existence of a Society of States implies laws controlling the relation of nation to nation lay, as we have seen, the conviction that a society of individuals implies a system of laws for the regulation of individual rights and duties. Nations with frontiers such as are found in North America, however, have no need to consult the works of Greek philosophers, Roman jurists, and other authorities, in order to realize that law is essential in even the simplest social organization. Descriptions of life among the prospectors in the Yukon, the ranchers of the plains, and the pioneers of the Pacific Coast abound in proofs that law is indispensable wherever people are organized in groups, no matter how small. Property and life, women and children, must be protected by the community. The cattle rustler and the horse thief, as well as the miner who makes away with the gold of his partner or flouts the claims of his rivals, meet with a retribution no less swift and sure than that of the murderer. In fact, in many of the early self-governing settlements the uninitiated felt tempted at times to count the judge a greater ruffian than the culprit, and found it difficult — so grim was the face of justice — to distinguish the social forces making for law and order from those that threatened chaos and disintegration. In these rude circumstances every moment's delay and every concession to the mercy that seasons justice might prove a menace to the welfare of the group.

Revenge, according to Francis Bacon, is a kind of wild justice; and, glancing at some of the first steps in the progress of law, one is inclined to say that retributive justice is a kind of regulated revenge. The law of like for like, ignoring the view that retaliation is no cure for a social ailment but is merely a means of its dissemination, substituted the vengeance of the community for personal blood-revenge. Like a vendetta or a family feud the *lex talionis* was not free from injustice and absurdity, frequently disregarding completely the character and motives of the accused and visiting on the innocent the iniquities of the guilty. Though it might seem to do to the accused what the victim, or the victim's relatives, would like to have done, yet, as the price of the social sanction, it demanded a limitation of the cruelty of personal revenge. Moreover, the substitution of legal procedure for the direct action of the individual avenger had two great advantages — deliberation on a question of right and wrong, and, closely associated with this deliberation, the development of a sense of joint responsibility in the social group.

The Code of Hammurabi, the Semitic King of Babylon, who reigned about 2100 B.C., gives evidence of an effort to apply the principle of like for like in a great many situations calling for legal redress. It is the oldest code known to the history of jurisprudence; it reflects the customs and judgments of a very crude state of civilization; and it is in consonance with the theory that "the more archaic the code, the fuller and minuter is its penal legislation." If a man destroy the eye of another, his own eye is to be destroyed; if he knock out the tooth of another, one of his own teeth is to be knocked out; and if a man break the bones of another man, his own bones are to be broken. No allowance for accident seems to have been made in these ancient laws. If a fire break out in a man's house and a man coming to extinguish it look covetously on the furniture of the owner of the house, and take the furniture of the owner of the house, "that man shall be cast into that fire." In this instance the principle of like for like is not applied without strain. Again, if a surgeon operate on a man for a

severe wound, and cause the man's death, or if he lance an abscess in the eye of a man, and destroy the man's eye, the surgeon's hands shall be cut off. In case the patient should be a slave, however, the surgeon shall give in compensation a slave of equal value. If a man bring an accusation against another man and charge him with a capital crime, but cannot prove it, he, the accuser, shall be put to death. If a man strike another man's daughter, under certain circumstances, and she die, the daughter of the culprit shall be put to death.

We are all familiar with a criminal code, as old as the decalogue, of a branch of the Semitic people other than that to which the Amorite king, Hammurabi, belonged.

“He that smiteth a man, so that he die, shall surely be put to death. And if a man lie not in wait, but God deliver him into his hand; then I will appoint thee a place whither he shall flee. And if a man come presumptuously upon his neighbor, to slay him by guile; thou shalt take him from mine altar, that he may die.

“And he that smiteth his father, or his mother, shall surely be put to death.

“And he that revileth his father, or his mother, shall surely be put to death.

“And if a man smite his bondman (or his bondwoman), with a rod, and he die under his hand; he shall be punished.

“Notwithstanding, if he continue a day or two, he shall not be punished: for he is his money.”

Again, if a woman be hurt under circumstances similar to those already alluded to in connection with the Code of Hammurabi, the person responsible shall be fined. “But if any mischief follow, then thou shalt give life for life, eye for eye, tooth for tooth, hand for hand, foot for foot, burning for burning, stripe for stripe.”

It is obvious that the Hebrew criminal law was superior to that of primitive peoples, who as a rule (though there are notable

exceptions) fail to recognize different kinds of homicide. The Hebrew code is a great advance beyond the Babylonian, though like the latter it reverberates the savage outcry of the avenger of blood, and metes out unequal justice to bond and free. Centuries of consideration and the ethical consciousness of a more highly developed civilization made possible the enunciation of a new principle — not blow for blow, violence for violence, hate for hate.

The resemblances between the Code of Hammurabi and the Mosaic law may be explicable on the ground that the latter is in part derived from the former, but the recurrence of the principle of like for like in the jurisprudence of peoples of divers races — often widely separated geographically — indicates that the law of an eye for an eye is a frequent, if not a universal and necessary, step in the development of criminal justice. *Lex talionis* obtains today among the Ossetes of the Caucasus and the Bangala of the Kongo. It was recognized in the ancient laws of the Magyars and the English; and even as late as the eighteenth century it continued to affect the legal codes of more than one European nation. The primordial sense that retaliation is the very essence of justice yields reluctantly to the mediation of tribunals. Gradually, however, blood-wite and wergild, and similar means of adjustment under the Brehon law, are found helping in the North of Europe to appease the demand for vengeance. Among the Greeks and Romans within historic times the *lex talionis* played a part, though an inconsiderable one, in the administration of criminal justice. In the *Iliad* we are presented with a picture of murderer and accuser disputing the amount of the blood-price before judge and elders and in the presence of the assembly.

The Law of the Twelve Tables, the first Roman code, formulated in the middle of the fifth century B.C. on the demand of the tribunes and designed to prevent the oppression of the plebeians by the patricians, was, though not unaffected by the influence of Greek law, in the main native and original.¹ It was more highly

¹ See, however, Révillout, E.: *Les origines égyptiennes du droit civil romain*, 1912.

developed than the early eastern codes in dealing with manslaughter and murder and in distinguishing an offense against public order from a sin against the gods. In the Twelve Tables, nevertheless, there are found interesting vestiges of the law of like for like. According to this code, for example, a man was to be burned alive in case he was convicted of setting fire to a building. Another section declares that if one man has broken the limb of another, and has failed to come to terms with him, like must be paid for like (*si membrum rupit, ni cum eo pacit, talio esto*). Here we seem to have evidence of the amendment of the traditional austere *lex talionis* by later judgments conceived in a more rational and humane spirit. If the doctrine of like for like was to be put aside, after having influenced for ages the theory and practice of law, it had to be replaced by a more adequate generalization.

Equity, according to Aristotle, is a species of justice, supplementing and amending the law whenever the statement of the latter is so general as to make its application in a particular case contrary to the intention of the lawgiver. It was through the influence of the Stoics, who interpreted equity in the light of their faith in the reasonableness of nature, that this legal principle became accepted in Roman jurisprudence. By a slow process of development, in which the juriconsults took an essential part, the formal and technical gave place to the substantial, the letter to the spirit, *jus strictum* to *jus æquum*. The barriers between the legal and the ethical gradually disappeared, and the efforts of centuries to harmonize the administration of the law with natural justice culminated in the clarification of the Roman Law in the time of Justinian. The Code, the Digest, and the Institutes embodied the judgments of generations of wise, tolerant, and public-spirited men. At the dawn of modern civilization the Chancellors of the Plantagenets, drawing their inspiration in some measure at least from the Civil as well as from the Canon Law of Rome, succeeded by the application of the principle of equity in limiting the pretensions of the feudal lords and in offsetting the rigid administration

of statutory law in England. Through these Churchmen the rising industrial and commercial classes, lightly but clearly described in the pages of Chaucer, were given protection, and a finer ethical spirit was infused into the traditional legal system. In competition with equity the common law revived, and regained something of its earlier plasticity. "Equity," wrote the late Professor Maitland, "had come not to destroy the law, but to fulfil it." Properly considered, it was an adjunct rather than a substitute. When in the opening years of the seventeenth century James I, wishing to assert the supremacy of the crown over all his judges, gave, with the support of Bacon and other advisers, the Court of Chancery the upper hand over the Common Law courts, Sir Edward Coke felt it necessary to champion the cause of the latter in opposing the absolutist claims of the king. At first a mere scion engrafted on a sturdier stock, equity threatened for a time to overshadow all the other branches of English law. Since, as becomes apparent in even a brief historical sketch, law both in theory and practice is a growing organism, dynamic rather than static, we may well ask how it is adapting itself to the complex conditions of contemporary civilization.

There is no lack of evidence to prove that the present state of law enforcement in some of the most highly civilized parts of the world leaves much to be desired. For example, of all the questions before the people of the United States no one is more important, an eminent authority declares, than the improvement of the administration of justice. This essential function of government has, wanting the support of a vigorous public sentiment, failed to control racial animosities and to keep pace with the industrial development of the nation, the growth of business enterprise, the advance of automobile and other transportation facilities, the influx of foreign workmen, the drift of the rural population toward the great manufacturing centers, the multiplied contacts of city life, and the increase of the mob spirit. A recent report of the Committee on Enforcement of the Law (of the American Bar Association) asserts that the crime situation in the United States, so far as crimes

of violence are concerned, is worse than in any other civilized country. Behind every defect in the enforcement of the law, it proceeds, more dangerous than any other factor accounting for the number of crimes committed in the country, is the apathy and indifference of the American people. "The administration of criminal law in the United States," says Chief Justice Taft, "is a disgrace to civilization. The trial of a criminal seems like a game of chance, with all the chances in favor of the criminal, and if he escapes, he seems to have the sympathy of a sporting public." The burden of responsibility for the recent increase in the number of serious criminal offenses must be shared not only by judges, prosecuting attorneys, and police (whose incompetence in this matter merely reflects the general ineptitude), but by such institutions as the home, church, school, college, press, and theater. In the years between 1910 and 1923 the number of convictions for forgery increased by 68.2 per cent, for robbery by 83.3 per cent, and for homicide by 16.1 per cent. When we add that a rapid growth in the number of homicides is due to the use of firearms in connection with robbery, it becomes fairly evident that the love of money lies at the root of the increase of crime in the United States. The scientific study of crime and punishment, as well as the history of the development of jurisprudence, warns us that recourse to very severe penalties, dictated by the ancient spirit of revenge, and to savage reprisals on the part of the more influential sections of society, does not offer a satisfactory solution of the problem of lawlessness now confronting American civilization. Since the time of Sir Samuel Romilly it has been generally recognized that the law by too great severity may become the accomplice of violence and the abetter of its own violation. Less dramatic but more effective ultimately are preventive and educative means and methods such as the juvenile court, the domestic relations court, the indeterminate sentence, an improved system of probation and parole, psychological and psychiatric examinations, the classification and segregation of delinquents, industrial farms and vocational training-schools, and — most fundamental of all — the

betterment of the economic conditions of the poor in the city and the country.

“Equal and exact justice,” says Chief Justice Winslow of the Supreme Court of Wisconsin, “has been the passionate demand of the human soul since man first wronged his fellow man; it has been the dream of the philosopher, the aim of the lawgiver, the endeavor of the judge, the ultimate test of every government and every civilization.” To protect the weak against the oppression of the strong, to deny or delay justice to no man, to guarantee to every citizen equality before the law, are the corner-stones of the codes, charters, and constitutions of civilized peoples in all places and at all times. Nevertheless, the very circumstances that have contributed to the general material progress have for the time being rendered untenable the assumption that all men have equal opportunities of maintaining their rights by legal process. Prosperous Americans have been so much absorbed in their individual affairs, as Elihu Root has pointed out, that they have been slow to appreciate the social changes which to so great an extent have put justice beyond the reach of the poor. In recent years it has been established with painful clearness that American justice is not impartial, that the rich and poor do not stand on an equality before the law, that the helpless and ignorant fall an easy prey to the crafty and unscrupulous, that hundreds of thousands of workmen are unable to collect wages honestly earned, and that the cost of litigation and the law’s delays form an insuperable obstacle between justice and those in most dire need of it. Public-spirited members of the legal profession are looking to the modification and reinterpretation of the laws, to the establishment of small-claims courts and other special tribunals, to conciliation and arbitration, to the appointment of public defenders, and to the numerous legal aid societies of America, as means of ameliorating the conditions of those for whom justice is now an unobtainable luxury.

REFERENCES — Bradway, J. S., Smith, R. H. and others: “Legal Aid Work,” *The Annals of the American Academy of Political and Social Science*, March, 1926;

Cardozo, B. N.: *The Nature of the Judicial Process*, 1921; Holmes, O. W.: *Collected Legal Papers*, 1920; Kirchwey, G. W.: "Crime Waves and Crime Remedies," *The Survey*, March 1, 1926; Maitland, F. W.: *Equity*, 1909; Pound, R.: *The Spirit of the Common Law*, 1921; Sherman, C. P.: *Roman Law in the Modern World*, 1917; Smith, R. H.: *Justice and the Poor*, 1919.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That a drastic enforcement of law is not the best means of dealing with crimes of violence.
2. Show by reference to the Code of Hammurabi, or any other early code, that the laws regulating the treatment of slaves were unjust, and note other characteristic features in the laws of the earliest civilized states.
3. Explain the paradox that the greatest justice may be the greatest injustice (*summum jus, summa injuria*), and that in mitigation an appeal may be made to the principle of equity. Illustrate by reference to the trial scene in *The Merchant of Venice*.
4. Give an account of the Vigilantes of California, and discuss the view that some kind of law is a social necessity.
5. Write an essay of three thousand words on the development of the juvenile court, commenting on the wisdom of its principles and procedure.
6. Give facts in support of the statement that in the American cities the administration of law has failed to keep pace with the rapidly changing social conditions.
7. Is justice impartial in the treatment of the rich and the poor? Support your judgment in this matter with facts and arguments.

X

PREVENTIVE MEDICINE AND THE TROPICS

Medical science, like jurisprudence, has been stimulated by the growth of modern industry and by commercial and colonial expansion. This holds true of bacteriology, parasitology, and the study of deficiency diseases. The fundamental investigations of Pasteur, one of the founders of bacteriology, were the outcome of his lifelong principle of combining an interest in the common everyday occupations with an interest in pure science. He expressly advocated a close alliance between laboratory and factory, and the purpose of all his early researches was to preserve and advance the industries of France, such as the production of wine, silk, and wool. It was in Glasgow, the busiest industrial and commercial center of northern Britain, that his disciple Lister began in 1865 to develop the theory and practice of antiseptic surgery. Before this time surgical operations performed in the cities had resulted in a much larger percentage of deaths than had those performed in the country, and the large hospitals — hotbeds of pyemia, tetanus, and gangrene — had proved unable to meet the needs of the urban population, constantly increasing in size as a result of the Industrial Revolution. In 1876 Koch announced his wonderful demonstration that anthrax, which had been ravaging the flocks and herds of Europe, was caused by *Bacillus anthracis*; and six years later he discovered the bacterial origin of tuberculosis, the control of which disease among the industrial classes is one of the most urgent contemporary problems. Scurvy, now known to be caused by a diet deficient in vitamin C, had first become a subject of special study after the voyage of Vasco de Gama around the Cape of Good Hope to India, when fifty-five of his

sailors had succumbed to this malady. In the middle of the eighteenth century James Lind, a surgeon in the British navy, famous for his contributions to nautical and tropical medicine, recommended orange and lemon juices as preventive of scurvy. It was only in 1907 that Axel Holst produced the disease in experimental animals, and showed precisely the nature of its cause.

Before the close of the nineteenth century occasion arose in the British possession Hongkong, the great distributing center of imports and exports off the southeastern coast of China, for the application of scientific methods in the study of plague. Epidemics of this disease had played a great part in the history of European civilization. It was known to the physicians of the Roman world about the middle of the second century A.D. It swept through the Empire in the time of Justinian and contributed to the ultimate triumph of the barbarians in the West. Familiar to students of history as the Black Death, it carried off tens of millions of the inhabitants of Europe about the middle of the fourteenth century, leaving political and cultural consequences of great importance. In the subsequent centuries the fading glories of Venice and of other commercial centers in the Mediterranean were still further diminished by the inroads of this pestilence. In the London of 1665, with a population of about 400,000, more than 68,000 deaths were recorded. When the Hongkong outbreak occurred in 1894, the disease was immediately studied by experts trained in modern methods of research. Within a few months the microöganism was discovered by Yersin and Kitasato, working independently. The former was a pupil of Pasteur; while the latter, a pupil of Koch, had shared with von Behring in the development of the serum treatment of tetanus and diphtheria. As plague is known to be transmitted by a kind of flea, the extermination of the rats and ground squirrels which harbor this insect is a fundamental means of prevention. In the autumn of 1925 the Canadian bacteriologist d'Hérelle, trained in the Pasteur Institute, announced that on the basis of investigations conducted in Indo-China he had treated

successfully in Egypt a number of cases of the bubonic form of the disease by the injection of bacteriophage.

There is an obvious association between the commercial and colonial expansion of the highly civilized nations and the growth of the scientific knowledge of cholera, beriberi, sleeping sickness, malaria, yellow fever, hookworm, and other tropical diseases. Cholera has for more than a hundred years been endemic in the Delta of the Ganges and in other parts of India. Its dissemination may be studied in connection with the opening up of trade routes and the development of transportation. In its invasion of Russia in 1830 it is believed to have followed the course of the caravan traffic northwest through Central Asia. Passing through western Europe, it crossed the Atlantic and entered America by way of the city of Quebec and the city of New York in 1832. It has also found its way more than once to Europe from India by the Mediterranean route. Malta has been visited by epidemics at least seven times since 1835. The introduction of steam navigation and the construction of the Suez Canal had a notable effect on the diffusion of the disease. Since cholera is not endemic in northern latitudes, epidemics are observed to move along the trade routes from the southeast to the northwest, and, under recent commercial conditions, from the ports of entry inland. Koch, while on a visit to Egypt and India as leader of the German Cholera Commission in 1883-1884, discovered in *Spirillum cholerae* the microörganism of Asiatic cholera, and verified the opinion that had been held by other authorities since the middle of the nineteenth century that the disease is water-borne. On August 16, 1892, there occurred two cases at Hamburg, the great commercial center on the Elbe. The number of persons stricken increased rapidly. There were 1024 new cases on August 27, and 561 deaths on September 2. Before the end of October there had occurred nearly 17,000 cases and more than 8,600 deaths. During this outbreak the neighboring city Altona remained free from cholera. It had a filtered water supply, while Hamburg for the most part made use of the unfiltered water of the Elbe. A few sections of Hamburg that shared

the water supply of Altona, and certain institutions in the former city which were supplied with spring water, escaped the epidemic. In Germany by measures based on a knowledge of the cause and mode of transmission of cholera, the disease was checked at the seaport, while in Russia it claimed in 1892 and the two succeeding years no fewer than 800,000 victims.

Like scurvy, rickets, and pellagra, beriberi — prevalent among the poor in the cities of the East — is a deficiency disease. It was first described in the early part of the seventeenth century by Bon-tius, professor at the University of Leyden, who had practised for years at Batavia on the island of Java. A second description of the disease, based on the observation of cases from the Orient, is found in the writings of Nicholas Tulp, known to all admirers of Rembrandt. The British surgeon Malcolmson published a classical account of beriberi in 1835. He did not overlook the relation of the disease to diet, but remarked that the Bengali sepoy, who habitually abstained from rice, was absolutely free from beriberi, while the rice-eating Madrasi was particularly afflicted with it. In comparatively recent times (1897) Eijkman, investigating this disease in the Dutch East Indies, maintained that it was there confined to people who lived almost exclusively on a diet of highly milled and polished rice. He reported that it might be prevented by adopting a varied diet, or simply by adding to the customary polished rice the parts of the cereal removed in the milling process. More recent investigations seem to show that the precise cause of beriberi (and of pellagra) is the absence from the diet of what we know by the blanket term vitamin B, and that the chief cause of rickets is the lack (especially in the absence of certain solar rays) of vitamin D. We are thus able to explain why among the British troops in Mesopotamia during the Great War the soldier's ration of canned beef and white bread or biscuit was insufficient to ward off beriberi, and why rickets occurs so frequently among the ill-nourished children in the gloomy slums of our large cities.

The study in the British colonies of the cause and mode of transmission of two parasitic diseases that are found among

domestic animals led to the discovery of the cause and mode of transmission of sleeping sickness in man. In 1880 Evans observed in India a microscopic parasite (of the genus *Trypanosoma* — Greek *try páo*, bore, and *sôma*, the body) in the blood of horses, and recognized it as the cause of surra, a disease of horses, mules, cattle, dogs, camels, elephants, and buffaloes. Fourteen years later, an outbreak of nagana having occurred among the cattle of south-eastern Africa, the British governor of Natal and Zululand asked David Bruce to undertake the work of investigation. An examination of the blood of the diseased cattle soon revealed the presence of another species of the genus *Trypanosoma*. Bruce found also that this microscopic parasite is implanted in cattle by the bite of the tsetse fly, and that the wild game animals of the district (buffaloes and antelopes), though immune to nagana, are the reservoirs from which the insect carrier draws its supply of trypanosomes. Six or seven years after these discoveries a violent epidemic of sleeping sickness occurred in Uganda among the inhabitants of the islands and shores of Lake Victoria, and in 1902 the Royal Society of London sent a commission to this equatorial region to make an investigation. In the meantime a species of trypanosome had been observed in human blood in both the French colony Algeria and the British colony Gambia. The same protozoan was in 1903 detected in the blood of sleeping sickness patients in Uganda by Castellani, who conjectured that this parasite is the cause of the disease. This conjecture was confirmed by Bruce and other members of the Commission. They proved also that the common tsetse fly of Uganda is the carrier of the parasite of sleeping sickness, or, trypanosomiasis in man. The disease may be prevented in three ways: — by destroying the wild animals which, as in the case of nagana, act as reservoirs of the protozoa; by destroying the tsetse fly; and by removing the inhabitants from those localities — fly belts — where the insect is found. The Uganda epidemic, which had cost about 200,000 lives, quickly came to an end after the natives had been moved inland.

The great advances that have been made in the last fifty years

in our knowledge of the etiology and prevention of malaria, which of all diseases has proved in the past most detrimental to human welfare, are closely associated with the history of commercial and colonial expansion. In 1880, Alphonse Laveran, a French army surgeon working at Bône and Constantine in eastern Algeria, discovered in protozoan parasites of the genus *Plasmodium* the cause of malaria. Fourteen years later Patrick Manson, who had been attached to a college of medicine in Hongkong and had proved in 1879 that the mosquito is the intermediate host of another pathogenic parasite, put forward the theory that the parasite of malaria completes its life cycle in the body of a suctorial insect. This theory Ronald Ross, an officer in the Indian Medical Service, made the subject of painstaking researches, carried on in the native state of Haidarabad, in the presidency of Madras, at Calcutta, and at Freetown in the British colony of Sierra Leone. His whole investigation occupied a period of over four years, serious interruptions occurring in the years 1897-1899. Finally it was demonstrated that the female *Anopheles* mosquito transmits the malaria parasite from the sick to the well. Before this truth was definitely established, Ross had turned his attention to the benefits likely to result from his researches, and after receiving appointment as lecturer in the new Liverpool School of Tropical Medicine, he delivered his inaugural address, June 12, 1899, on "The Possibility of Extirpating Malaria from Certain Localities by a New Method." Instead of giving an account of the investigation begun by him in tropical India in May 1895, he spoke of preventing malaria by making war on the insect carrier of the disease.

The control of yellow fever, which made feasible the construction of the Panama Canal and thus brought about an expansion of commerce that is almost incalculable, was associated with the intervention of the United States on behalf of Cuba in 1898. Walter Reed, who did so much to promote this great triumph of preventive medicine, had entered the United States Army Medical Corps in 1875 at the age of twenty-four. He spent eleven years in garrison duty in Arizona, Nebraska, and Dakota, but he was

able for a short time in 1881, and also in 1890-1891, to learn something of the progress of modern medicine. His great opportunity to contribute to that advance came when, in 1900, yellow fever having broken out among the United States troops in Cuba, he was made chairman of an Army Board appointed to investigate the epidemic and to suggest means for its control. He quickly set aside such vague surmises as that yellow fever was a filth disease and that it was caused by an insidious and inexplicable poison; he put to the test of experiment the assumption that the disease might be contracted by contact with clothing and bedding polluted by yellow fever patients; and he examined no less systematically the hypothesis, which had been stoutly maintained for twenty years by Dr. Carlos Finlay of Havana, that a certain species of mosquito plays the essential part in the transmission of the disease. Before the end of the year 1900 Reed, ably supported by the other members of the Army Board as well as by the public-spirited soldiers and nurses who took part in the necessary experiments, proved conclusively that yellow fever is conveyed solely by the bite of the female *Stegomyia* mosquito. More recently Noguchi¹ has reported the discovery of the causal organism.

In 1899 the discovery by B. K. Ashford, surgeon in the United States Army, that hookworm disease was the cause of 12,000 deaths a year in Porto Rico led to an intensive study of the parasite and to the formation of plans to check the infection. It had been known before that time that this disease was very widespread. It had been identified with the chlorosis of the ancient Egyptians. In 1838 Dubini had described the nematode worm, *Ankylostoma duodenale*, which Bilharz and Griesinger later recognized as a parasitic cause of the disease. An epidemic among the laborers at the St. Gothard Tunnel in 1880, which halted the work of construction, had further roused the curiosity of European in-

¹ "Dr. Hideyo Noguchi, member of the Rockefeller Institute for Medical Research, died on May 21 in Africa of yellow fever, which he contracted while working on the disease." *Science*, May 25, 1928. The question of the etiology of yellow fever is still *sub judice*.

vestigators. But the British occupation of Egypt, and still more, as already implied, the occupation of Porto Rico by the United States, opened a new epoch in the study of a disease that is a blight on every continent and prevails to a frightful degree in the tropics and subtropics. Arthur Looss of the Government School of Medicine, Cairo, was enabled by experiments on dogs and men to trace the route by which the larvæ of the parasite enter the skin and find their way to the duodenum and jejunum. In 1902 the American zoölogist C. W. Stiles discovered that the parasite in hookworm disease in the Western Hemisphere is, as a rule, not *Ankylostoma duodenale* but *Necator americanus*. The scientific study of the parasites was followed by Ashford's crusade (1903-1904) in Porto Rico, during which 30 per cent of the inhabitants of the island were treated for hookworm disease, and by the efforts of the Rockefeller Sanitary Commission, under the guidance of Stiles, to banish the infection from the Southern States. This commission, which began work in 1910, was later merged in the International Health Board, the multifarious activities of which organization include efforts to control malaria and to extirpate yellow fever, and an anti-hookworm campaign extended to many countries of the Eastern and the Western Hemispheres and to numerous islands of the sea.

The records of boards of health, sanitary surveys, and quarantine systems, the success of Gorgas in Cuba and Panama, of Ross at Ismailia, of Cruz at Rio de Janeiro, of Bruce in Uganda, etc., strengthen the conviction that preventive sanitation and hygiene, developing with the knowledge of the causes and modes of transmission of communicable diseases, will render certain the progress of commercial and colonial enterprise in the tropics. Indeed, some writers go so far as to dream of future empires in the tropical and subtropical latitudes (where more than one of the great civilizations of the past flourished) as the culmination of the expansion of the white races of Europe and America.

REFERENCES — Bruce, D. (Sir): "Prevention of Disease," *Report of the British Association for the Advancement of Science*, 1924; d'Hérèlle, F.: "Essai de

Traitement de la Peste Bubonique par la Bactériophage," *La Presse Medicale*, October, 1925; Frazer, H. and Stanton, A. T.: *Collected Papers on Beriberi*, 1924; Libby W.: *The History of Medicine in its Salient Features*, 1922; Osler, W. (Sir): *The Evolution of Modern Medicine*, 1921; Ross, R. (Sir): *Memoirs*, 1923; Sherman, H. C.: *Chemistry of Food and Nutrition* (revised ed.), 1918; Singer, C. A.: *A Short History of Medicine*, 1928; Vincent, G. E.: *The Rockefeller Foundation Annual Reports*, 1924-1927.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the control of hookworm infection in India would be of greater advantage to the masses of the people than the acquisition of political autonomy.
2. Give an account of the effects of the plague on the development of European civilization in the fourteenth century.
3. Show the relation between the occurrence of epidemics of cholera and the development of modern commerce.
4. Describe the chief scientific discoveries of Pasteur and Lister, emphasizing the bearing of these discoveries on the industrial conditions of the nineteenth century.
5. Write an essay of three thousand words on Walter Reed, expressing your judgment concerning the significance of his scientific achievements.
6. Discuss the prospects of further commercial and colonial enterprise in the tropics in consequence of the development of medical science.

XI

THE INDUSTRIAL REVOLUTION

Continuing our study of the relation of the various vocations to the progress of mankind, we find that in the latter part of the eighteenth century there occurred in Great Britain a series of changes made possible by the development of physical science and technology, stimulated by the growth of commerce and the acquisition of colonies, and no less important in the history of civilization than the contemporary political changes brought about by the American Revolution and the French Revolution. There were many phases of this transformation of industry: the invention of machines for the production of textiles, the substitution of water-power and steam for man-power and horse-power, the increased use of coal and iron, the transfer of spinning and weaving from the home to the factory, the extension of the practice of the division of labor and the development of many new kinds of occupation. With these changes were associated the lessened importance of agriculture as compared with manufacture, the increase and shifting of population, the increase and redistribution of wealth, and the rise of modern capitalism and the credit system. The introduction of better means of transportation and, eventually, of telegraphic communication demands special consideration. We shall see also in later chapters that the Industrial Revolution entailed the growth of cities and the growth of democracy, and that it was of necessity associated with all subsequent economic, social, and political advance.

For ages before the middle of the eighteenth century improvement in the tools and appliances of agriculture, cloth making, and other industries, had come very slowly. Even in the twentieth

century — when an up-to-date farm equipment may include a combined harvester and thresher drawn by a traction engine — the most primitive reaping instruments have scarcely passed out of use. The modern sickle, like the saw and chisel, has its prototype among the stone implements known to archeology. It is not very difficult for the present generation to recognize in the ancient Egyptian means of tilling the soil the forerunner of the modern hoe and mattock, or to trace the development of the plow from its most primitive form, roughly fashioned from a forked tree, to the most complex forms now in use. In the making of cloth no apparatus more elaborate than the antique hand loom, distaff, and spindle was employed among the civilized peoples of the West until the spinning-wheel was introduced into Europe from India about the middle of the fourteenth century. From the East came also the stimulus that brought about the development of modern textile manufactures, and, in a large measure, the substitution of machinery for tools and other simple implements.

Cotton cloth was an important item in the commerce of the peoples of southern India more than two thousand years ago. Our word "calico" is derived from "Calicut," the name of that city on the western coast visited by the Portuguese under the command of Vasco da Gama in 1498. Muslin was made by the natives on the east as well as on the west coast and by other peoples of the Orient. The English word for this fabric comes from the French word *mousseline*, which meant originally a textile made in Mosul. During the seventeenth century the British East India Company imported cotton goods into Great Britain to a considerable extent. This ultimately aroused the opposition of a number of influential English merchants interested in the sale of silks and of woollens (the great staple of the country), and led to the passage of the Calico Act in 1720. This measure was described in the preamble as "an act to preserve and encourage the woollen and silk manufactures and for the more satisfactory employment of the poor, by prohibiting the use and wear of all printed, painted, flowered or dyed calicoes in apparel, household stuffs, furniture or otherwise."

This enactment — apart from its purely philanthropic purpose — was intended to promote the woolen and silk interests, but in the long run it had the effect of building up the manufacture of cotton goods in Great Britain and of stimulating every means of increasing the rate of production.

It was under these circumstances that in England — where a demand for cotton fabrics had been created by a hundred years of commerce with India, where the supply to meet that demand had been suddenly curtailed by legislation, and where the raw material could still be imported — there occurred in rapid succession a number of improvements in the devices and methods employed in spinning and weaving. In 1732 John Kay invented the flying shuttle, which increased fourfold the rate of the weaving process. Five years later Wyatt and Paul patented a machine with rollers to draw out and make uniform the strand of fibers to be twisted into thread. In 1767 Hargreaves invented his famous spinning-jenny, which by aid of additional spindles produced eight times as much thread or yarn as the old spinning-wheel. Arkwright, appropriating the ideas of Highs, developed the spinning-frame, soon to be operated by horse-power, by water-power, and ultimately by steam. In 1779 Crompton invented the spinning-mule, so called because it combined the good features of its immediate forebears — carrying a number of spindles and drawing and twisting the fibers. Before the invention of these spinning-machines, the slowest part of the manufacture of cotton goods had been the production of the thread. Now, however, it became necessary again to speed up the weaving process. About 1787 Edmund Cartwright invented the power loom. Assurance of further advances in the manufacture of cotton and other textiles came when engines made by the firm of Boulton and Watt were employed to operate the machines in Arkwright's factories.

The change that took place in the industrial life of Great Britain in the second half of the eighteenth century could hardly be called a revolution were it not for James Watt's invention of the steam-engine patented in 1769. Earlier attempts to make use in

the industries of power derived from fuel had followed the scientific experiments of Otto von Guericke and Robert Boyle with the air-pump in the seventeenth century. One of the most successful of these attempts was the invention of the Newcomen air-and-steam engine in 1705, in which steam was used to raise the piston in a cylinder, while the atmospheric pressure served to drive the piston down as the steam condensed. When in 1763 Watt was asked to repair for the physical science department of the University of Glasgow a model of the Newcomen engine, he was struck by the wastefulness of cooling the cylinder — by the injection of cold water — at each downward thrust of the piston. Concerning the quantity of energy thus wasted he consulted Dr. Joseph Black (who had just made some very important contributions to the theory of heat), and then proceeded to devise an engine, provided with a separate condenser, to obviate this waste. Later, dispensing altogether with the use of atmospheric pressure, Watt succeeded in constructing a steam-engine, in which he was to employ steam — admitted alternately to either end of the cylinder — to drive the piston to and fro.

The development of the coal mines in Great Britain had demanded some mechanism, supplementing man-power and horse-power, to pump water from the pits (ever deepening as the industry grew), to sink shafts, and to haul coal to the surface. The Newcomen engines were frequently described as machines for lifting water by fire, and the Watt steam-engines were at first largely used to pump water out of coal mines. These engines by employing coal as a source of power tended to increase the demand for coal they were meant to supply. As fuel, coal had been used to a considerable extent since medieval times; but, partly owing to the growing scarcity of wood, its consumption was greatly increased after the middle of the sixteenth century. In the decrees of the reign of Queen Elizabeth and in the enactments of Parliament may be traced the record of the deforestation of England — of the southeastern counties, as well as of the districts to the north and west soon to be recognized as rich in coal deposits. By

the end of the seventeenth century the yearly output of coal from the English mines amounted to two and a half million tons; by the middle of the eighteenth century it had risen to four and three-quarter million; by 1770, to six million; by 1790, to seven and a half million; and by the end of the eighteenth century, to more than ten million tons.

The history of the iron trade in England is closely associated with that of the coal mines and the steam-engine. The successful construction of steam-engines presupposed, of course, a considerable development of the iron industry. The depletion of the forests in parts of Kent, Sussex, and Surrey, where at one time half of the pig iron of the country was produced, was justly ascribed to the activities of the ironmasters, who before 1735 had relied exclusively on charcoal for the smelting of ores. In that year coke, which we might term the mineral analogue of charcoal, was used with signal success by Darby. In spite of this innovation the English iron trade was still in a state of depression in 1740; there were only fifty furnaces in operation in the whole country, and the quantity of pig iron produced was less than that imported. About this time Huntsman introduced his method of preparing crucible cast steel, which, along with other improvements in technique, ushered in a revival of the industry. Smeaton (in 1760) and others contributed to the improvement of blowing apparatus. In 1783 Cort secured a patent on his machine for turning out bars of iron by means of grooved rollers; and in 1784 (ten years after the discovery of oxygen by Priestley) he gave to the world the reverberatory furnace, in which metal could be freed of excess carbon by oxidation. In view of the rapid advances made at this time in metallurgy and other branches of technology we may claim for the second half of the eighteenth century a share in "the invention of the method of invention," which a recent writer attributes to the first half of the nineteenth.

The factory system, which had already existed to some extent for ages, was so enlarged and modified by the invention of spinning and weaving machines for the production of cotton, woollen,

and other fabrics, and by the introduction of new means of operating these machines, that before the beginning of the nineteenth century a factory was officially defined as a place where textiles were produced by mechanical power. Manufacture in its rebirth was no longer equivalent to handiwork or handicraft. A much different relation from that which had existed in the past between master and journeyman now developed between the owner of the machine and the man who fed it, between the employer and the employee, the capitalist and the wage-earner. Workmen, concentrated in masses for mass production, while they might gain in ability to coöperate with one another, lost something of individual initiative and personality. At times they were reduced to the condition of mere *hands*, a part of the mechanism, though aware of their dependence and degradation. In the factories and mines of England women and children employees in great numbers were subjected to almost incredible hardships and indignities. Though the increase in the total wealth of the nation was enormous, the benefits of progress were very unevenly distributed. To hundreds of thousands of people who had gained a comfortable living under the domestic system of industry, the introduction of labor-saving machinery seemed a curse rather than a blessing.

The practice of the division of labor, like the factory system, was modified and carried much further after the advent of modern machinery and the use of steam. It was no new thing in the eighteenth century. It was an extension of the differentiation of the occupations which, as we have seen in previous chapters, is one of the essentials of a progressive civilization. In Great Britain at the time of the Industrial Revolution Adam Smith, author of the *Wealth of Nations* (1776), clearly set forth the advantages of applying in factories the principle of the division of labor. He pointed out that the apparently simple enterprise of pin making admits of analysis into several distinct operations. Should one workman undertake to perform all these, he will be able to produce not more than a score or so of pins a day; if, however, a group of ten men work in unison, each of them responsible for one

operation, their combined efforts will produce tens of thousands of pins a day. The economist foresaw the invention, as a result of the analysis of various manufacturing processes, of a great number of machines which would enable one man to do the work of many. The pin-making machine of today, which performs all the distinct operations of which Adam Smith spoke, and which turns out several hundred gross an hour, is a good example in modern industry of the fulfilment of his prophecy. The history of shoe-making in the United States, from the early colonial times when each farmer tried to make his own footwear till the present, when a shoe factory may be equipped with 137 different kinds of machine, offers another illustration of the value to industry of the division of labor. Of the many new occupations that arose at the time of the Industrial Revolution the manufacture of machinery itself will serve as an example.

The development of manufacturing as a vocation in Great Britain toward the close of the eighteenth century bore a close relation to the development of agriculture and to the increase and shifting of population. The Enclosure Acts, which with the introduction of better methods of farming contributed much to the general wealth, had the effect of weakening the agricultural laborers in their attachment to the soil. They hastened to offer their services to the factories. The free movement of the laborers from one locality to another had become an industrial necessity in which the landed proprietors as well as the manufacturers gladly acquiesced and before which old regulations binding each man to one parish as his legal domicile readily gave way. The exodus from the country helped to swell the numbers in the growing industrial towns and cities. The total population of England increased from about six million in 1740, to nine million in 1800, and to twelve million in 1821. Counties toward the north and northwest, in which iron and coal had been found in abundance, grew at the expense of counties in the south and southeast. Places such as Birmingham, Sheffield, Leeds, Manchester, and Liverpool took on a new importance.

In spite of the continued poverty of the laborers who had remained on the land and the growing destitution of the laborers in the industrial centers, the wealth of England was increased by the improvement of its agriculture, by its manufacture of textiles (for which there seemed to be an unlimited demand), by its extended commerce, by the revival of its iron trade, and by the development of its mines. Banks sprang up in great numbers in response to the needs of the rapidly growing industries. To the old landed proprietors, merchants, and money-lenders, were now added capitalists and *entrepreneurs* of a new type, men like Sir Richard Arkwright with the shrewdness and aggressiveness necessary for success under modern industrial conditions. For a time factory proprietors and factory laborers were alike exempt from government regulation. The manufacturers competed without restraint for the control of domestic and foreign markets; they hired men, women, and children at the lowest possible wages and for the longest possible hours, and they black-listed all employees who ventured to agitate for better conditions. The workmen formed associations, and resorted to strikes and violence. Before the end of the eighteenth century, however, Parliament declared illegal "all agreements between journeymen and workmen for obtaining advances of wages, reduction of hours of labor, or any other changes in the conditions of work." In 1802 there followed the first of a series of Factory Acts restraining to a certain extent the rapacity of the manufacturers. Indeed, the history of the Industrial Revolution, which began in Great Britain in the second half of the eighteenth century and is still in full swing, indicates that modern civilization has been or is being completely transformed through the introduction of machinery and the development of manufactures.

REFERENCES — Beard, C. A.: *The Industrial Revolution*, 1902; Cooke-Taylor, R. W.: *The Factory System and the Factory Acts*, 1912; Hayes, C. J. H. and Moon, P. T.: *Modern History*, 1923; Hulme, E. M.: *A History of the British People*, 1924; Swank, J. M.: *History of the Manufacture of Iron*, 1892; Thurston R. H.: *A History of the Growth of the Steam Engine*, 1902; Toynbee, A.: *Lectures*

on the Industrial Revolution of the Eighteenth Century in England, 1884; Turner, E. R.: *Europe (1789-1920)*, 1920; Usher, A. P.: *The Industrial History of England*, 1920; Warner, G. T.: *Landmarks in English Industrial History*, 1899.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the Industrial Revolution had more far-reaching effects on the development of civilization in Great Britain than had the French Revolution on the development of civilization in France.
2. Sketch the early history of the Industrial Revolution in France, Germany, and the United States.
3. Describe the spinning-jenny, the spinning-mule, the first power loom, or the cotton-gin. Show the significance of any one of these machines in the development of textile manufactures.
4. Show the relation between the development of physical science and the inventions of Newcomen, Watt, and Cort.
5. Trace the development of banks and the credit system in Great Britain and the United States in their relation to the Industrial Revolution.
6. Give an account of the Luddite riots of 1811. Does the present unemployment situation in the United States present a parallel?
7. Explain as definitely as you can the part played by the practice of the division of labor in the production of automobiles.

XII

TRANSPORTATION AND TELEGRAPHIC COMMUNICATION

The improvement of transportation in Great Britain during the second half of the eighteenth century and the first half of the nineteenth kept pace, as already implied, with the general industrial and commercial progress of the time. The history of highway development, of the increased use of the stage-coach, of canal construction, of the invention of the locomotive, and of the introduction of railways and of steam navigation, is intimately interwoven with the history of textile manufacture, of the growth of mining and metallurgy, and of the opening up of new industrial centers. The most important events in the early stages of modern transportation in Great Britain occurred in counties well endowed with mineral resources — such as Gloucester, Stafford, Lancaster, York, Durham, and Northumberland. These parts of the island have commercial and industrial advantages in addition to the possession of mineral deposits. Some of their cities are favorably situated for trade with America, Ireland, or the continent of Europe, while others command the inland trade routes of Great Britain. For example, Newcastle-on-Tyne, Hull on the Humber, Bristol on the Avon, and Liverpool on the Mersey, are fitted by their locations for foreign trade, while Manchester, the center of the cotton industry, and Birmingham, close to the iron and coal mines of Staffordshire, occupy strategic positions on the internal lines of communication. The improvement of the routes connecting London with the cities of the north and west was, of course, an important part of the development of transportation in Great Britain.

It was in Yorkshire and Lancashire that a forerunner of Telford and McAdam carried on his work as road builder from 1765 till

1792. This was John Metcalf, familiarly known as Blind Jack of Knaresborough, whose loss of sight from smallpox at the age of six did not prevent him from leading a strenuous life as stage driver, sportsman, horse dealer, soldier, smuggler, cotton merchant, and road engineer. The old Roman roads, as well as the numerous highways constructed by turnpike trusts after 1663, had proved unable to withstand the strain of the growing traffic of the eighteenth century. It had become necessary to use pack horses to carry such commodities as grain, textile fabrics, and even coal. Metcalf was thoroughly acquainted, in spite of his affliction, with the roads between the Humber and the Mersey. Under his direction road improvements involving great expense were carried on between Doncaster and Wakefield, Bury and Blackburn, and other places well known in the history of textile manufacture. He studied the nature of the different soils, leveled the roads, built bridges, culverts, and retaining walls, and in one instance succeeded in running a highway — from Huddersfield to Manchester — over a supposedly impassable bog. Telford, 1757-1834, in addition to his many other engineering achievements, improved the routes connecting England with Scotland and Ireland by building roads from Carlisle to Glasgow and from Shrewsbury to Holyhead. He paid particular attention to the curvature of roads in cross section, to drainage, and to the choice of materials. His famous contemporary McAdam, after much observation and numerous experiments, reached the conclusion that granite and other hard rocks broken into small pieces afford the best road material. It was at Bristol, where he had been appointed surveyor of roads in 1815, that he succeeded in demonstrating the value of his special methods of construction. It is not unworthy of mention that through his influence a number of turnpike trusts were consolidated and the various roads around the city of Bristol were put under the control of one body of trustees.

The improvement of the stage-coach and the stage-wagon service in Great Britain advanced with the improvement of the highways connecting the industrial and commercial centers. At the

beginning of the eighteenth century, largely owing to the bad condition of the roads, it had taken six or seven days to go by stage from York to London. Efforts to increase the speed of travel resulted in the setting up of a number of "flying coaches" and "flying machines" between London and the cities of the north and west. As early as 1734 there is record of the Newcastle Flying Coach which sought, with limited success, to shorten the time of the journey to London by the use of relays of horses. Birmingham established a similar service in 1742. In 1754 some enterprising merchants of Manchester undertook to carry passengers direct to London, a distance of 182 miles, in four and a half days. Four years later Liverpool boasted a flying machine that could outdo the flying coach of the rival city. In 1760 similar facilities for rapid transit were established between Leeds, Sheffield, and London. There was a parallel development of stage-wagon service to replace the carriage of freight by pack horse. The really glorious epoch on the highways of Great Britain began, however, in 1784, when the plan of John Palmer to carry the mail by coach received the support of Pitt the Younger, newly appointed first lord of the treasury. The first mail-coach ran on the road between London and Bristol; and within a very short time regular postal service by mail-coach connected the capital and Birmingham, Leeds, Nottingham, Manchester, Liverpool, Holyhead, and Edinburgh. On good roads and with good horses it was not difficult to maintain a speed of ten miles an hour. The pages of English literature in the decades following the introduction of the mail-coach service show with what enthusiasm this great advance in transportation and communication was hailed.

The improvement of the waterways of Great Britain can be traced to the same industrial and commercial needs as promoted the improvement of the highways. Very little progress in the building of canals had been made till after the middle of the eighteenth century. One signal success, however, in 1760-1761 paved the way for other advances. This was the work undertaken by the young and earnest Francis Egerton, Duke of Bridgewater, in order

to connect his collieries at Worsley with the city of Manchester, about ten miles distant. This enterprise called for the exercise of considerable ingenuity on the part of the engineer, James Brindley, as the canal had to be carried over the river Irwell at Barton by means of an aqueduct. One immediate result of the opening of this waterway was a fifty per cent reduction in the price of coal at Manchester. Brindley, at the instigation of Bridgewater, succeeded also in constructing a canal from Manchester to the Mersey, thus establishing a water route between that industrial center and its seaport Liverpool, through which passed the bulk of its raw materials and a large part of its finished products. Through the skill of Brindley, Telford, and other engineers, the Mersey, Trent, Severn, and Thames Rivers were brought into connection with one another by a system of canals. In 1791-1794 there developed a mania for canal construction and also for speculation in canal shares. It was about this time that William Smith, engaged as an engineer in the construction of the Somerset Coal Canal, so enlarged his knowledge of strata as to earn from posterity the title of founder of historic geology. By 1795 Yorkshire was connected with Lancashire by three canals. Birmingham had become the center of a network of artificial waterways. Scotland vied with England in promoting commerce and industry by river improvement and canal construction. Particular mention should be made of the Caledonian Canal, for which Watt had made a survey in 1773, which was completed under the direction of Telford, and opened to sea-going vessels in 1822. The general economic advantages derived at this time from the improvement of the British waterways were very great; but they would have been much greater had it not been for the lack of public spirit and business foresight of the canal companies and for their failure, except in a few cases, to enter into coöperation and combination with one another.

The most notable successes in the use of steam to propel watercraft were the outcome of efforts to improve canal navigation. Soon after Watt had secured a patent on his steam-engine,

attempts were made to apply steam in the navigation of rivers. In 1776 the Marquis de Jouffroy d'Abbans obtained a measure of success on the river Doubs with a steam-driven boat, the *Palmipède*, fitted with a propeller designed to imitate the movements of water fowl; and six years later he substituted for this apparatus paddle-wheels, and managed to navigate a boat, thus equipped, for a considerable distance on the Saône. For canal boats no less than for river boats the introduction of steam promised decided advantages. A number of unsuccessful and partly successful experiments were conducted in England and Scotland. Finally, in the opening year of the nineteenth century, Lord Dundas, the governor of the Forth and Clyde Canal Company, commissioned William Symington, the engineer, who had long been interested in the problem of steam navigation, to undertake a practical solution. In 1802 Symington launched the steam tug-boat *Charlotte Dundas*, which proved capable of carrying passengers and hauling freight barges on the canal. The Duke of Bridgewater was so much impressed by the performance of this tug that he gave orders for eight boats of similar design, but his death in the following year prevented the immediate success of the steamboat on English canals. Robert Fulton, the distinguished American, who in 1796 had published a *Treatise on the Improvement of Canal Navigation*, constructed in 1807 the *Clermont*, the first commercially successful steamboat in the history of the world. This was the supreme event in the progress of modern water transport.

The development of the locomotive and the railway, like the development of the steam-engine, the canals, and the steamboat, was particularly stimulated by the needs of the British mining industry. Cugnot's project of a carriage operated by steam (1771) had proved abortive. It was not till 1786 that the model of a workable locomotive was constructed in a mining district of Cornwall by William Murdock, employed by Boulton and Watt, and later famous for the part he played in the development of coal-gas lighting. He was prevented from securing a patent. For Murdock's pupil, Richard Trevithick, engaged in the Cornish mines, was

reserved the honor of constructing, in 1804, the first locomotive. An engine, designed by Trevithick, and used in a South Wales colliery, was able to draw ten-ton loads at a speed of five miles an hour. Further successes were soon reported from the collieries of Yorkshire and Durham. At Wylam, near Newcastle, Blackett, making use of the drawings of Trevithick, succeeded in constructing a serviceable locomotive. George Stephenson, mechanic of the Killingworth colliery, after he had examined the engine at Wylam (his birthplace), produced in 1814 a locomotive capable of hauling a thirty-ton load up a slight grade. A few months later he succeeded in overcoming the difficulty, partly met by Trevithick, of maintaining in the locomotive a steady pressure of steam. This he ingeniously accomplished by connecting the exhaust pipe with the furnace. By thus establishing a forced draught Stephenson laid the foundations of railway transport throughout the civilized world.

In one sense railways had existed before the invention of the locomotive. Double stone tracks, gauged to accommodate the trams, or coal-cars, had been used at some collieries for decades to evade the difficulties of ordinary roads. Stone tracks were frequently superseded by timber tramways, and at times these wooden rails were protected by a sheathing of iron plate. As early as 1776 cast-iron rails, which later gave way to wrought-iron, were brought into use at Sheffield. But it was not till 1825 that a railway with locomotive and train was opened for public use. This was controlled by the Stockton and Darlington Railway Company, to which Stephenson had been appointed engineer. The main purpose of this organization was to transport coal from the Darlington collieries, in the county of Durham, to Stockton a few miles east on the river Tees. On September 27, the day of the public opening, one of Stephenson's locomotives drew a train of thirty-four vehicles from Darlington to Stockton, covering the distance of twelve miles in fifty-three minutes. Nearest the "Locomotion" were six trucks loaded with coal and flour; then followed a "coach" for the directors of the company, and twenty-one trucks

with seats occupied by five or six hundred people; and finally, emphasizing the chief aim of the Stockton and Darlington Railway Company, six trucks loaded exclusively with coal. In the autumn of 1829, when in a series of tests on the Liverpool and Manchester Railway Stephenson's *Rocket* proved superior to all rival engines, the importance of steam transportation by land gained general recognition. On this occasion one of the leading British newspapers said: "The experiments at Liverpool have established principles which will give a greater impulse to civilization than it has ever received from any single cause since the Press first opened the gates of knowledge to the species at large." New companies were rapidly formed, and new plans for railway construction were projected and executed. Short, local lines, such as the Stockton and Darlington and the Liverpool and Manchester, coöperated and combined with other lines in such a way as to suggest the ultimate development of a national system of railways.

Railway construction would not have proceeded so rapidly had it not been for the introduction of the electric telegraph, the first important application of electricity in the history of human progress. The practical results achieved by Cooke and Morse had been preceded by more than a hundred years of scientific investigation and discovery and by numerous attempts to turn the new knowledge to account. As early as 1729 Stephen Gray had found that electricity may be conveyed by means of an insulated wire. The famous discoveries of Galvani and Volta before the end of the eighteenth century marked a great advance in the comprehension and control of physical phenomena. In 1820 Oersted announced his discovery of the relation of magnetism and electric currents. Further discoveries by Ampère, Sturgeon, Ohm, Faraday, and Henry soon followed. The application of electricity in the service of mankind received new consideration. Gauss and Wilhelm Weber in 1833 devised apparatus to transmit words and short sentences from the physics department of the University of Göttingen to the local observatory, a distance of about three thousand yards. "I am convinced," wrote Gauss, "that in this way messages can be

telegraphed direct from Göttingen to Hanover." In 1836 William Cooke, an Englishman engaged in the study of medicine at Heidelberg, witnessed the demonstration of similar apparatus, and immediately conceived the plan of employing the invention in connection with the systems of railway then developing in England. Relinquishing his medical studies, he returned to his own country; he opened negotiations with the Liverpool and Manchester Railway Company; with the coöperation of the physicist Wheatstone he invented special telegraphic apparatus, obtaining his first patent in 1837; and he tested his system on the London and Birmingham, the Great Western, and other British railways. After 1845 an improved Cooke and Wheatstone telegraphic apparatus was very quickly adopted by all the railways of Great Britain. In 1835 the illustrious Professor Samuel F. B. Morse of New York University had developed a plan for the telegraphic transmission of signals. In 1844 a telegraph line was set up between the Capitol at Washington and the southern terminal of the Baltimore and Ohio Railway. Within a few years the system of Morse was extensively used by the railway companies of the United States.

There is, of course, an intimate relation between scientific research and those advances in telegraphic communication and in methods of transportation which are more recent than the period under discussion. Under the expert direction of William Thomson (later Lord Kelvin) permanent communication by submarine cable was established between Europe and America in 1866. Ten years later Graham Bell announced the invention of the telephone. There followed the invention of wireless telegraphy and telephony (radio communication) and initial successes in television. The use of electricity on street-car, interurban, and other railway lines, and the development of methods of generating and transmitting electric energy, might suffice to indicate that a new phase of the Industrial Revolution is at hand. The use of liquid hydrocarbons as fuel and the invention of internal combustion engines have given us such means of conveyance as the automobile, the airplane, the dirigible, the motor-boat, and the motor-ship. The omnibus and

the motor-truck have made highway transport once more the rival of railway transport. Among the many other contributions of technology to industrial and commercial progress, the invention of the steam-turbine has added an important page to the history of transoceanic steam navigation, which began with the voyage of the *Savannah* in 1819.

REFERENCES — Chatburn, G. R.: *Highways and Highway Transportation*, 1923; Cleveland-Stevens, E.: *English Railways*, 1915; Gray, T.: "The Inventors of the Telegraph and Telephone," *Smithsonian Institution An. Rep. for 1892*; Jackman, W. T.: *The Development of Transportation in Modern England*, 1916; Kirkaldy, A. W. and Evans, A. D.: *The History and Economics of Transport*, 1921.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the railway has had a greater influence on the development of modern civilization than has the newspaper. (Note the quotation in the text: "The experiments at Liverpool have established principles which will give a greater impulse to civilization than it has ever received from any single cause since the Press first opened the gates of knowledge to the human species at large.")
2. Outline the history of highway and railway transport in Scotland from 1750 to 1850, giving the location of the chief coal and iron deposits of the country and tracing the history of its manufactures.
3. Show by reference to the imaginative literature of the first part of the nineteenth century that the mail-coach created at that time the same sort of enthusiasm as the airplane creates now.
4. Describe the first commercially successful steamboat, and give an account of the immediate results in America of Fulton's enterprise.
5. Write an essay of three or four thousand words on the development of transoceanic steam navigation.
6. Sketch the history of electrical science as related to the development of transportation.

XIII

THE MEASURE OF CIVILIZATION

It seems fitting at this point, as we are about to approach the discussion of the more abstruse phases of contemporary civilization — the municipality, the school, democracy, socialism, and other social and political institutions and ideals — that we should ask ourselves by what standard a people's state of advancement shall be judged. And in undertaking this inquiry we must be careful of course not to accept without qualification ill-considered and *ex parte* judgments, from whatever quarter they may come. We must beware alike of the extreme claims of idealists and materialists. On the one hand, we must not attach undue importance to the suggestion of certain clergymen that the physicist, the chemist, and other representatives of the exact sciences cease work till the tardy laborers in the social sciences and other divisions of the field of theoretical and practical knowledge come abreast of them, or to the insinuations of certain social philosophers that, as the result of new inventions, mankind acquires powers so great that it is beyond its ability to employ them wisely, that the physical and natural sciences may be getting too complex and difficult for the intelligence of practical people to deal with, and that the advance of knowledge in our times may be proving detrimental to the growth of wisdom.¹ On the other hand, although it is not surprising, in view of the remarkable changes brought about by science in transportation, manufacturing, mining, trade, agriculture, etc., that some form of economic progress should appear at first glance to be of superlative importance, we must decline to accept at its face value the opinion that any single branch of science or technology, or any particular vocation, constitutes the

¹ Compare Urwick, E. J.: *The Social Good*, 1927, pp. 5-6.

essence and criterion of human advance. We have no need to elaborate the argument. The very multiplicity of the occupations, indeed, indicates that the claim — recently put forward by railway engineer or railway counsel — that the civilization of the world can be measured by its transportation and that the culture of a people can be computed in terms of mileage, speed, and freight rates, hardly calls for serious consideration.

To Guizot, the French historian and statesman, the nature of civilization appeared in a different light. To him the very word *civilization* suggested the idea of progress, of development, of the improvement of civil life, and called to mind the thought of a people in course of social amelioration. "On the one hand," he said, "there is a definite increase in the power and well-being of society at large; and, on the other, a more equable distribution of this power and well-being among the individuals of whom society is composed." At the same time, comprised in the concept civilization is that of the development of the individual life, of the various powers of the human mind, that is, of the man himself. In France, in the seventeenth and eighteenth centuries, in spite of industrial and political backwardness, there was an expansion of the human intelligence that made the country the most civilized in Europe. A similar claim could be maintained for Rome in the time of Augustus. No civilization worthy of the name ignores the development of those intellectual and moral qualities which distinguish man from the brute. Fortunately, the elements of which civilization is composed are intimately associated with one another, the progress of society entailing the moral and intellectual progress of the individual, just as the latter is incomplete if deprived of the former. For example, in the judgment of Guizot, Christianity addressed itself in the first place to the betterment of the individual rather than to the improvement of social and political conditions; yet, though it made no attempt to free the slaves or to deliver the provinces from the yoke of Cæsar, it proved eventually the champion of social and political liberty.

Buckle, the English historian, held that moral and intellectual

progress is essential to the conception of civilization. Intellectual truths are the *cause* of progress according to Buckle, who was a follower of Condorcet and Comte in endeavoring to trace a causal relationship between the progress of the sciences and human progress in general. He concedes that a people cannot be said to advance who, while gaining in knowledge, are becoming less virtuous. If, he proceeds, the advance of civilization and the happiness of mankind depend more on moral feelings than on intellectual knowledge, we must, of course, measure the progress of society in terms of feeling; while if, on the other hand, civilization and human happiness depend principally on knowledge, we must take as our standard the amount and success of intellectual activity. In Buckle's opinion, however, loyalty to moral principle maintains, as ballast, the equilibrium of society, while truth supplies the driving power. Pious exhortations to honor our parents, to do good to others, to sacrifice our desires for their benefit, to forgive our enemies, to love our neighbors as ourselves, to consecrate our lives to social service, are sanctioned by many centuries of human experience. Their triteness does not detract from their importance. But it is the function of the intellect rather than of the moral feelings to formulate new doctrines and to adjust us to new conditions. Therefore, knowledge and intellect are the standard and criterion by which the civilization of a people must be measured. There is no evidence, according to Buckle, that any improvement takes place in the native, inherent qualities of man. Indeed, he goes so far as to maintain that a child born in a civilized country is not likely, as such, to be superior to one born among barbarians, and that the difference ensuing between a child born in Africa and one born in England must be owing to social contacts and other circumstances.

Emerson also, in a series of Orphic utterances, describes civilization in terms of advance. It is a certain degree of progress from the lowest state in which man is born. The term, he says, imports a mysterious progress. The most advanced nations are always those which navigate the most. For knowledge, as for commerce,

the seashore has been the point of departure. "When the Indian trail gets widened, graded, and bridged to a good road, there is a missionary, a pacificator, a wealth-bringer, a maker of markets, a vent for industry. Another step in civility is the change from war, hunting, and pasturage to agriculture." A sufficient measure of civilization is the influence of good women, and the right position of women in the state. Civilization may be measured by the diffusion of knowledge through books, newspapers, and letters. The tendency to combine antagonisms and to utilize evil, as when a prison becomes a workshop or a reform school, is an index of high civilization. Civilization is marked by complexity, the division of labor, the multiplication of the arts of peace, by personal liberty, free speech, and justice. The highest civility has never loved the hot zones. Yet high degrees of moral sentiment control the unfavorable influences of climate; and some of our grandest examples of men or races come from the equatorial [or, rather, sub-tropical] regions — as the genius of Egypt, of India, and of Arabia. Civilization depends on morality; that is the one condition essential to the social education of man. There can be no high civility without a deep morality. The evolution of a highly destined society must be moral; it must run in grooves of the celestial wheels; it must be catholic in aims. Though the popular measure of progress will ever be the arts and the laws, in strictness the vital refinements are the moral and intellectual steps. Civilization implies the evolution of a highly organized man, brought to extreme delicacy of sentiment, as in practical power, religion, liberty, sense of honor, and taste. Its true index is, not the census, nor the size of cities, nor the crops, but the kind of man the country turns out. Culture corrects the theory of success. Civilization becomes strong by borrowing the might of the elements, the forces of steam, gravity, galvanism, light, magnets, wind, and fire.

In discussions more recent than Emerson's concerning the nature and measure of civilization we must expect to find a different tone and emphasis. It is the predominance of science, in the judgment of Bertrand Russell, that distinguishes the present age from

all preceding ages. Science, though potent for evil, is capable of advancing the welfare of mankind far beyond any point attained in the past. Industrialism and mechanical inventions — the outgrowth of the sciences — have aided in establishing a certain degree of mutual understanding and coöperation among the peoples of the earth. We may assert, in spite of paradox, that the very fact that so many nations were drawn into the last war indicates the unity of civilization and the essential solidarity of the human race. Civilization, the pursuit of objects not immediately necessary for self-preservation, arose when through successful agriculture, particularly in the Valley of the Nile and in Mesopotamia, men became able to produce more than they consumed. Leisure thus gained permitted the development of the art of writing, metallurgy, architecture, medicine, botany, chemistry, astronomy, geometry, and other branches of mathematics. In Egypt, where the history of so many of the sciences began, the accumulation of possessions had proceeded for ages, furthered both by the peculiar advantage of the Nile inundations and by the preservative nature of the climate. In Russell's opinion each of the great civilizations — the Persian, the Macedonian, the Roman, and the Arabian, for example — was superior to its predecessors in two respects: in knowledge, and in extent of organization. As regards scientific knowledge it may not be immediately evident that the Romans of the second century A.D. were better equipped than the Greeks of the fourth century B.C., or that Bagdad under the Abbasides had any advantage over Rome under the Antonines. However, the Romans, though they contributed very little to the development of the sciences, were able by force of arms to gain control of all the erudition of the Greeks, and there had been very great advances in anatomy, physiology, and other branches of learning, from the time of Hippocrates till that of Galen; while the Arabs, after carrying their conquests east and west, absorbed and improved upon the science of Egypt, India, Persia, and Greece.

We shall now undertake to prove that recognition of the importance to human progress of *the accumulation of possessions*,

or, failing that, the appropriation of the possessions of other peoples, helps us to explain some of the most difficult problems in the history of civilization. For instance, how came it that the Greeks within a few centuries of their appearance in the peninsula, in the islands of the Ægean, and on the coast of Asia Minor, were transformed from barbarism or savagery to an advanced state of civilization? As soon as these nomad tribesmen from the north reached the Mediterranean basin, they came into contact with the appurtenances of three great civilizations—the Egyptian, the Cretan, and the Babylonian. Of these civilizations the first-named was older than the second. The Ægeans had after 3000 B.C. begun to attain to a considerable degree of culture, which made headway on the island of Crete—most accessible from Egypt—spread to the neighboring islands, to the coast of Asia Minor, and finally to the mainland of Greece. Soon after the Cretan or Ægean civilization reached in the fifteenth century B.C. its highest development, the islands came into the possession of Egypt. In the meantime, the barbarian Greeks had advanced into the Peloponnesus in successive waves. In the second of these, about 1500 B.C., the Dorians had carried all before them. After another hundred years they passed into Crete. Later the Ionians and other Hellenes overran the coast of Asia Minor. These incursions might seem fraught with disaster to the cause of human progress. Our most authoritative historians maintain, indeed, that by 1200 B.C. the splendors of Ægean civilization had been almost submerged by northern barbarism, little better than the rude culture of the Stone Age. The barbarian Greek tribesmen, however, rapidly imbibing Mesopotamian influences through contact with the Hittites and Egyptian influences through contact with the Ægeans, by the middle of the ninth century B.C. celebrated their victories on the coast of Asia Minor and their adventures among the islands of the sea by the composition of the *Iliad* and the *Odyssey*, which seem to represent the culmination of a great literary epoch rather than its crude beginnings. How can we account for this rapid development of Greek civilization without acknowledging that in getting the materials,

the paraphernalia of culture, the barbarians from the north straightway became civilized?

Similarly, the Semitic peoples have from early times shown a remarkable aptitude for appropriating the cultural possessions and assimilating the civilization of other races. Before the end of the twenty-eighth century B.C. Akkadian nomads had overcome the Sumerians along the lower stretches of the Tigris and Euphrates and adopted the indigenous civilization — the Sumerian mode of living, government, business methods, calendar, weights and measures, astronomy, medical lore, art of writing in cuneiform characters, and, to a limited extent, vocabulary. This Semitic triumph in Mesopotamia was repeated about six hundred years later by the Amorites, who made Babylon the center of a new empire. In the twelfth century B.C., and in a subsequent epoch, a third Semitic stock, the Assyrians, a rude warrior people of little native culture, conquered the Babylonians — very much as the Romans conquered the Greeks in the second century B.C. — seizing the goods and assimilating the civilization of the vanquished. A somewhat similar story may be told concerning the acquisition and diffusion of culture by the western Semites. Through trade the Phenicians and Arameans came into contact with all the civilized peoples of antiquity. The former, after discarding the use of cuneiform characters, devised about 1000 B.C., probably under Egyptian influence, the alphabetic system of writing. In modified form this was introduced by Aramean merchants, along with their language, into the greater part of western Asia. A brief reference to the Old Testament must suffice, in this connection, to indicate the immense debt of civilization to the Hebrew people. "It tells the story," says Professor Breasted, "of how a rude shepherd folk issued from the wilds of the Arabian desert, to live in Palestine and to go through experiences which made them the religious teachers of the world." From our present point of view they owed no less to their geographical position than to the peoples who had held them in bondage, for Palestine was a center where Egyptian, Babylonian, Ægean, and Greek civilizations mingled, and where

both the material and the spiritual treasures of the world found a welcome.

Even more striking than the indebtedness of these Semitic peoples to the possessions of the more highly civilized nations with which they came in contact is the indebtedness of their kinsmen the Arabs to the tangible inheritance to be found in Persia and India, Asia Minor and Egypt in the seventh century A.D. Within a few years after the death of Mohammed his followers had overcome the forces of Persia and the Eastern Empire, gaining possession of splendid cities, noble government buildings, churches, hospitals, schools, libraries, musical instruments, arms, implements, precious and useful metals, statuary, paintings, carvings, glassware, ornaments of all kinds — in brief, those cultural possessions which are an index of a people's civilization. Among the many evidences of the eagerness of the Arabs to acquire the cultural equipment of the more advanced peoples may be mentioned their quest of Greek manuscripts and their zeal in translating the scientific works of the Greco-Roman period.

The sudden emergence of the early Greeks, of the early Semitic peoples (whatever may have been their native culture), and of the Arabs to the highest rank among civilized peoples, affords an explanation of what is happening in both hemispheres in our own day. Japan, for example, after having borrowed the arts and industries, written language and general culture of China, deliberately set herself within recent times to acquire all those things that characterize Western civilization, such as science and technology, modern methods of manufacture, transport, and communication, military and naval equipment, colonial possessions, and a well-organized national government. It is particularly gratifying that Japan, along with her material success, is responsive to the finer ethical ideals of civilization; for her remarkable advance may be followed immediately by that of the hundreds of millions of Asiatics beyond the boundaries of her empire.

REFERENCES — Buckle, H. T.: *History of Civilization in England*, 1857-1861; Burrows, R. M.: *The Discoveries in Crete*, 2d ed., 1908; Glotz, G.: *The Aegean Civilization* (one of the series on *The History of Civilization*, edited by C. K. Ogden), 1925; Guizot, F. P. G.: *The History of Civilization in Europe*, 1828; Hawes, C. H. and H. B.: *Crete the Forerunner of Greece*, 1909; King-Hall, S.: *Western Civilization and the Far East*, 1924; Mason, W. A.: *A History of the Art of Writing*, 1920; Russell, B. and D.: *Prospects of Industrial Civilization*, 1923; Stearns, H. E. and others: *Civilization in the United States*, 1922; Tagore, R.: "East to West," *The Atlantic Monthly*, June, 1927.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the development of a system of writing is the decisive step from barbarism to civilization.
2. Distinguish civilization, as a stage in human progress, from barbarism and savagery. What is comprised in the concept civilization? Compare your answer with the table of contents of this textbook.
3. Would the welfare of mankind be advanced by halting temporarily the progress of physics, chemistry, biology, anatomy, surgery, therapeutics, ethics, or philology?
4. Is the transportation system of a people an infallible index of its general advancement?
5. Discuss the view of Guizot that the progress of society entails the moral and intellectual progress of the individual.
6. Do you think that Buckle is right in maintaining that knowledge and intellect are the standard by which the civilization of a people must be measured?
7. Compare Emerson's views concerning the nature of civilization with those set forth in this textbook. Would he have welcomed Bertrand Russell's recognition of the function of science in establishing a certain mutual understanding and coöperation among the peoples of the earth?
8. What is your explanation of the "Greek miracle," that is, the sudden emergence of Greek civilization? Granted the exceptional character of the Greek intellect, why did it not produce a great cultural epoch in 2000 or 3000 B.C.?

XIV

THE GROWTH OF CITIES

Though their government in the main falls far short of the ideal, the growth of cities, the great repositories of the cultural equipment discussed in the preceding chapter, is intimately associated with the general advance of mankind. Civility and civilization imply the existence of an organized and coöperative society such as is found only in the larger centers of population, while urbanity is by definition the complaisance and adaptability found more frequently in cities than elsewhere. The fact that words like *rustic*, *bucolic*, *boorish*, *pagan*, and *heathen* have now lost much of their earlier connotation indicates that people living on the land in English-speaking countries have shared in the progress of the towns and cities. Nevertheless, there are not wanting arguments to uphold the view of Aristotle that the best habitat for the human species is a community organization and that man is by nature a civic animal. As a corrective at least it is necessary to lend some support to this view; for the charm of early associations, love of rural scenery, and revolt against the degrading features of life in modern cities, have combined to warp the judgment of many in regard to the advantages of the more populous districts. In fact, it is not infrequently asserted that children born in the country have a better chance of succeeding in civilized communities than those born in cities. Investigation seems to show, however, that the largest cities in the United States, in spite of their numerous shortcomings, give birth, in proportion to population, to five times as many distinguished people as do the rural districts, while the wealthy homes in the outskirts of the cities have an even greater advantage over the farms. The child of a business man has a

much better prospect of achieving eminence than the child of a farmer; and the child of a professional man, and particularly of a clergyman, has a much better prospect than the child of a business man. In the race for distinction the children of unskilled laborers, both in the country and the city, carry of course a heavy handicap.

Disregarding London, with its huge population of 7,742,212, we may glance at the growth and progress of the largest manufacturing cities of Great Britain as typical of the changes brought about by the Industrial Revolution. Liverpool increased in population from less than 12,000 in 1720, to 35,000 in 1770, to 77,000 in 1801, to 376,000 in 1851, to 685,000 in 1901, and to 804,000 in 1926. These figures are a fair index of the industrial and commercial development of Great Britain during the last two centuries. The menace of social degradation through the rapid growth of its population Liverpool has endeavored to ward off by various measures carried out under expert direction, such as the provision of an ample supply of pure water, the establishment of public baths, the improvement of the drainage, the development of the parks, and the construction of municipal hospitals and municipal dwellings. It has met exceptional difficulties by a display of public spirit that suggests comparison with the local patriotism of the cities of the Middle Ages and of antiquity. The growth of the neighboring city Manchester, numbering 730,550 inhabitants in 1926, has been closely parallel with that of Liverpool. The construction of the Manchester Ship Canal at a cost of five million pounds and the operation of a municipal gas plant at a handsome annual profit are among its most notable enterprises. Similar accounts might be given of the growth and progress of Birmingham, Sheffield, Leeds, and other English manufacturing centers. The first-named, since the election of Joseph Chamberlain as mayor in 1874, has been especially distinguished for its success in clearing up slum areas, opening up thoroughfares, establishing a municipal bank, libraries, parks, and recreation grounds, and carrying out a municipal housing plan. About the same size as Liverpool or Manchester at the

beginning of the nineteenth century, Birmingham, with a population of over 900,000, now ranks as the third city of Great Britain.

Glasgow affords another striking example of urban growth resulting from industrial and commercial prosperity, of the dangers to the welfare of the masses of the people attending the rapid development of manufactures, and of the efforts of an enlightened public spirit to meet these dangers. In 1763 Glasgow was an attractive town of 28,000 inhabitants. Smollett in *Humphry Clinker*, his last and greatest novel, has left a picture of it as it was before the coming of the Industrial Revolution. A hundred years later it had grown to be a busy manufacturing and commercial city of 390,000. During the American Civil War it enjoyed extraordinary prosperity, turning out many craft especially designed to run the blockade of the Southern States. It was here, as mentioned in a previous chapter, that Lister, stimulated by the obstacles in this rapidly growing city to the successful treatment of industrial accidents, developed the theory and practice of antisepsis. Today Glasgow, celebrated for its commerce, ship-building, cotton trade, and iron and steel manufactures, has a population of over a million. It is frequently cited as a shocking instance of urban squalor and degradation. Fortunately, its citizens are deeply imbued with community spirit and a sense of civic responsibility. It has led other progressive and enterprising cities in drawing its water supply from a mountain lake (Katrine). Gas, electric light, and street railways have been brought under municipal control. Following a crisis in the private management of the tramways in 1894, the city took over their ownership and operation. Success was almost immediate. With a service at less than two cents a fare on the average, the municipality succeeded at that time in covering all expenses and making a considerable contribution to the community chest. Within twenty years the example of Glasgow as regards the ownership of street railways was followed by one hundred and thirty-seven British municipalities. The city, moreover, is the owner of workshops and extensive farm lands; it has cleared up certain notoriously unsanitary districts, widened streets, estab-

lished a good system of street cleaning and refuse disposal, and shown energy in dealing with the housing problem.

Germany has not only experienced, like all other highly civilized countries, a rapid increase of urban population as a result of the development of manufactures, but she has adopted well-concerted measures to meet the new conditions. In 1870, when the Industrial Revolution had hardly got under way in Germany, nearly seventy per cent of her people were engaged in agricultural pursuits; now there are fewer than thirty per cent so engaged. During the same interval the number of German cities with a population of one hundred thousand has increased from fewer than ten to more than fifty. A number of these larger cities have grown more rapidly than Cincinnati, Buffalo, New Orleans, Louisville, Providence, Rochester, and other American cities of the same class. Even students familiar with the giant strides of the largest cities of the United States and Great Britain are surprised at the growth of Berlin (4,013,588), Hamburg (1,079,092), Cologne (698,064), Munich (680,704), Leipzig (679,159), Dresden (619,157), Breslau (554,801), Essen (468,696), and Frankfort-on-the-Main (461,849). In spite of the efforts that have been put forth, more than seventy-five per cent of the people living in the larger towns and cities are not satisfactorily housed, and the stamina of the inhabitants is likely to be undermined by the conditions in the poorer and more congested districts. But Germany is aware of the dependence of all future progress on the well-being of the urban population. Making science the servant of municipal politics, she has called to counsel (along with the engineer, the economist, the physician, and the educator) the expert in city administration, which is now definitely recognized as a special vocation. Colleges have been founded to train officials capable of undertaking the work of city improvement. Artists have been stimulated by prizes to prepare plans for the extension and the embellishment of the cities. Düsseldorf is a particularly brilliant example of a city which has been reorganized under the direction of an expert administration. It is a model of city planning in which

all the requirements of a busy manufacturing center are met without sacrificing the beauty of the avenues, promenades, and water front. The municipality not only controls the schools, libraries, natural history museum, art gallery, theater, hospitals, and water supply, but it owns and operates the street railway, the gas works, the electric light plant, has invested in interurban railway stock and in real estate, has undertaken a comprehensive housing plan, and maintains a mortgage bank, a pawnshop, a community forest, and an employment bureau.

President Lowell remarks that of all the kinds of government in America the least successful has been the government of great cities. The failure in this department of the public service he ascribes to the popular distrust of experts, especially of administrative experts. This distrust must be overcome in order that government by the people may not be put to shame. At the present stage in the development of civilization, it is clear that no man is capable of taking over the functions of the hunter, fisher, farmer, herdsman, lumberman, miner, manufacturer, and merchant. We doubt the ability of untrained and inexperienced men to build bridges, to preside in the courts of justice, to manage railways and factories, banks and hospitals. We consider it wiser on the whole to entrust the command of armies to professional soldiers rather than to semi-professionals or amateurs. We hesitate to sanction the appointment to leading positions in our institutions of higher learning of men lacking in scholarship or academic antecedents. Other things being equal, we prefer to choose as teachers candidates who have received special professional training. Indeed, we are gradually losing faith in the jack of all trades, invaluable and indispensable as that type is on the frontier and among primitive peoples. Nevertheless, we still persist in electing as the chief administrative officials of our largest cities local politicians with little knowledge and experience of scientific municipal government. Not unnaturally there has recently arisen in more than one of the American cities a vigorous movement toward the reorganization of municipal government. In the opinion of the advocates of the

commission-manager plan progress in city government demands above all the inauguration of a regular profession of municipal administrators. In discussing the need of a training school for municipal service Professor Beard says: "Surely such an enterprise is worthy of the best talents and energies which this nation can produce, and yet it is strange that in the midst of much talk about training for military service, so little thought has been given by the people at large to the task of training and selecting the great army of civil servants, now amounting in the United States to nearly two millions. It is doubly strange that in an age of magnificent benefactions to universities, no one has as yet had, or at least realized, the vision of a great school of administration — an institution imperatively demanded by our democracy now struggling heroically to become efficient enough to bear the burdens of an industrial and imperial civilization."

The need of special scientific training for municipal administrators appears all the more urgent when we take into account the acknowledged defects in the government of the American cities and the remarkable rapidity of their increase in population. In 1830 Chicago was a hamlet of fewer than one hundred inhabitants. After the development of steam transportation in America, it became a city of 28,000 in 1850, of 109,000 in 1860, of 299,000 in 1870, of 503,000 in 1880, of 1,100,000 in 1890, of 1,700,000 in 1900, of 2,185,000 in 1910, of 2,700,000 in 1920, and of 3,102,800 in 1927. Small wonder that this *enfant terrible* among the great cities of the world should suffer chastisement at times on account of its ill-regulated industries, congested slums, and inadequate police protection. The population of New York increased from 1,911,000 in 1880, to 5,620,000 in 1920, and to 5,970,800 in 1927. Under the circumstances it is not strange that in the tenement districts of the lower East Side, where more than six hundred thousand people are crowded into an area of two square miles, the housing conditions are worse than any to be found in Europe. During the same intervals the population of Philadelphia increased from 847,000 to 1,823,000, and to 2,035,900; of Detroit, from 116,000 to

993,000, and to 1,334,500; of Cleveland, from 160,000 to 796,000, and to 984,500; of St. Louis, from 350,000 to 772,000, and to 839,200; of Baltimore, from 332,000 to 733,000, and to 819,000; of Boston, from 362,000 to 748,000, and to 793,100; of Pittsburgh, from 235,000 to 588,000, and to 665,500; of Los Angeles, from 11,183 to 576,000, and to 1,300,000.

As already implied, the cities of the United States have failed to keep pace with the cities of Germany and England in housing reform and in the exercise of foresight. Land values in the heart of prosperous American cities have mounted so high that unskilled laborers cannot pay the rent of a dwelling save in a crowded tenement or in a house built in unsanitary back premises. As the business and industrial activities grow, the space for the poor within the city limits becomes necessarily more and more restricted. Landlords hold property for speculation, while exacting high rentals and refusing to make improvements or repairs. In the great American metropolis, in spite of enlightened legislation, masses of workmen still live in the old-style tenement flat with one room facing the alley or backyard and other rooms — closets beyond closets — having no access to light and air except the door and an aperture cut in the partition and called a “window” to soothe the public conscience. One of the leading New York newspapers testifies that two million people are thus living in tenements that have been outlawed but cannot, without extraordinary measures, be replaced. What sort of citizens, ask the investigators, will the generation make that is born and bred in these abodes? Here is a challenge of national import, which only far-sighted and progressive statesmanship directed by expert knowledge can adequately meet.

No one can observe an American city without being impressed by the difference between the slum on the one hand and the wealthy residential district or suburb on the other. It requires greater ingenuity to indicate the likeness between them than it does to state the difference. Nevertheless, a fundamental likeness exists. Many social workers have found that the essential tragedy of the slum is its isolation. They draw a contrast between

a mere aggregation of fifty thousand people in a city slum and a well-organized provincial city of fifty thousand inhabitants. The latter has its quota of gifted men — lawyers, doctors, clergymen, journalists, teachers, politicians, men of property — in short, the natural leaders of community life mingling daily with one another and with all the people, playing the neighbor in a great variety of ways, encouraging in the young the development of special abilities and aptitudes, checking tendencies to disorder and lawlessness, leavening the mass and quickening the sense of civic interests and civic purposes. If to the slum, leadership and intelligent guidance could be imparted, it might be transformed from a chance conglomeration of human derelicts into a living and progressive social organism. Such is the philosophy of the university settlement movement. Whether this be true or not, what shall be said of the wealthy residential district or suburb? Does it share with the provincial city in the possession of a vigorous and progressive community life, or is it composed of unrelated elements which the accident of wealth has thrown together? The dwellers in the suburbs no less than the dwellers in the slums pay the penalty of segregation and isolation.

REFERENCES — Bruère, H.: *The New City Government*, 1912; Fitzpatrick, E. A.: *Experts in City Government*, 1919; Goodnow, F. J.: *Municipal Government*, 1909; Howe, F. C.: *European Cities at Work*, 1913; Munro, W. B.: *The Government of American Cities*, revised ed., 1916; Thompson, J. G.: *Urbanization, its Effects on Government and Society*, 1927; Visser, S. S.: "The Occupations and Environment of the Fathers of American Notables," *Who's Who in America*, vol. xiii, 1924; Wilson, W. (President): "The College Man in Municipal Politics," address delivered October 27, 1905; Wood, Edith E.: *Housing Progress in Western Europe*, 1923; also, *The Housing of the Unskilled Wage Earner*, 1919; Woodruff, C. R.: *A New Municipal Program*, 1919; Zueblin, C.: *American Municipal Progress*, revised ed., 1915.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That cities are essential to the highest type of civilization.
2. Show the effect of the Industrial Revolution on the increase and distribution of population in Great Britain.

3. Do you consider that the experience of Glasgow and other European cities has proved that the municipal ownership of street railways is advisable? Discuss.
4. Is the administration of a modern city too complicated a business to be entrusted to amateurs? Is the inauguration of a regular profession of municipal administrators consistent with democratic principles?
5. Trace the effect on the growth of the cities of the United States and Canada of the development of the steamboat and the railway.
6. Why are the housing conditions worse in New York and Chicago than in any European city? Can these conditions be adequately improved under a system of private ownership?
7. Give a brief account of the University Settlement Movement, explaining the principles on which it was based.
8. Discuss the statement that the suburb is as much in need of the slum as the slum is of the suburb.

XV

THE GROWTH OF DEMOCRACY

As even a brief and partial survey will show, the history of democracy is closely associated with that of the cities and of the humbler occupations. In the city-states of antiquity the control of government passed, though not without vicissitudes, from the one to the few and from the few to the many. At Athens about the close of the sixth century B.C. an era of industrial and commercial prosperity increased the wealth and numbers of the artizan and mercantile classes, created a civic spirit fatal to tyrants and oligarchs, and led to such reforms in the constitution as laid the foundations of Greek democracy. The naval victory of Salamis in 480 B.C., resulting from the foresight and skill of Themistocles, brought a further expansion of commerce and industry and enhanced the power of the more progressive political party. A few decades later Athens, under the democratic leadership of Pericles, entered that period of commercial, political, intellectual, and artistic progress, the record of which is still the brightest page in the history of civilization. As in Athens so likewise in Rome, the expulsion of the despots left the control of public affairs in the hands of the oligarchs. As the western city grew in size and prosperity, however, the plebeians succeeded in securing a far greater share in the government than had ever been obtained by the like social class in Athens. After Augustus had in the first century B.C. gained ascendancy in Roman politics, the growth of democracy was arrested for centuries. But, in spite of that arrest, liberty based on equal laws was preserved, as we have seen in an earlier chapter, as the legacy of republican Rome to all civilized peoples.

Feudalism, the rule of a military oligarchy, gave way toward the close of the Middle Ages before the growing power of the towns and cities supported in some cases by the influence of prelates and monarchs. The functions that had been concentrated in the hands of the barons and counts were gradually taken over by judges, legislators, aldermen, kings, and emperors. Such privileges as the coining of money and the maintenance of regular armed forces were denied the nobility. As the countries of Europe became more prosperous and more thickly populated, the monarchs could obtain the means to provide armies and to curb the power of their more turbulent vassals. The royal or the imperial exchequer was enriched and the collection of taxes facilitated by the increased commerce and industry and the increased circulation of money. The burghers, in England for example, were permitted to substitute money payments for garrison duty or service in the field. Many royal charters were purchased by the English towns during foreign wars when the Plantagenet kings were in need of money to defray the expenses of their campaigns. In some localities the barons, ruined by their own extravagance, readily entered into negotiations with the towns and cities for the sale of their feudal privileges; while in others the citizens successfully asserted their rights by weight of numbers and force of arms. By the beginning of the fourteenth century, before the use of cannon had changed the method of battle and siege and upset the prestige of the armored knight, feudalism had ceased in nearly all parts of Europe to be the prevailing form of social organization. At least, the glory of chivalry had departed, and the towns and cities had begun to hold out the promise of a new type of civilization.

Among the cities of Italy, Milan offers a particularly good illustration of the growth of the democratic spirit. It was in this city, which inherited the political wisdom of the south and the virile energy of the north, that *Parlamento* (Parliament) was first used to designate a popular assembly of free citizens and *Comune* (Commune) to signify a civic community comprising nobleman and commoner, churchman and layman, master and man, rich

and poor — all the elements entering into the composition of one social organization. From the time of Charlemagne, whose policy was to weaken the influence of the nobility and to strengthen that of the Church, various circumstances had helped to free Milan from feudal control. With the support of the archbishops the Milanese were able to keep themselves independent of any local secular power. They were made strong in their independence by the necessity of defending their territory against incursions from the north. Before the end of the eleventh century Milan and other cities of Lombardy had become autonomous republics. In 1162 Frederick Barbarossa, seeking to extend the imperial sway, captured the city and destroyed it. It was soon restored, however, with the assistance of the confederated cities, Brescia, Bergamo, Mantua, etc. The Emperor was decisively beaten at Legnano in 1176, and seven years later — partly through the mediation of the Pope — the independence of the cities of the Lombard League was confirmed by treaty. For Milan an era of remarkable prosperity followed; the population, already large in the preceding century, now rapidly increased; and the city became particularly famous for the manufacture of armor, the fabrication of woollens and silks, and other kinds of industry. The guilds of handicraftsmen gained control of the administration of the city. Though the power of the Church had been less detrimental to the growth of the democratic spirit than had that of the feudal lords, the Milanese, as they increased in numbers and wealth, undertook to free themselves from the domination of the archbishops and their lieutenants. In the thirteenth, fourteenth, and fifteenth centuries, however, Milan fell a prey to autocrats and adventurers. As John Addington Symonds remarks, the idea of forming a confederacy of free cities which would rule the whole Italian peninsula was slow in making itself effective. In northern Italy throughout the Middle Ages, and much later, one's native city remained the focus of patriotic sentiment. The modern nationalistic ideal grew to maturity elsewhere.

Long before the Renaissance certain industrial and commercial

centers of northern France, Flanders, and the adjoining territories, had begun to carry on the tradition of the free cities of Italy. As early as the twelfth century St. Omer, Lille, Ypres, Bruges, Ghent, Douay, Brussels, Antwerp, Mons, and Liége had secured by charter privileges concerning such matters as the administration of justice, the control of police, the regulation of the markets, the collection of tolls and fines, the levying of taxes, and the election of magistrates. Thus, gaining from king or ruling nobleman one concession after another, they took the first steps toward freedom and independence. Those cities of this group (as well as others, such as Cambrai, Tournay, Namur, and Valenciennes) which came to rank as *communes* advanced with particular boldness in the same direction. Prosperous merchants and other local leaders, entering into a covenant, agreed under oath to stand by one another in resisting the pretensions of the feudal lords and in demanding virtual self-government. Some of these cities claimed a full share in the control of military affairs, and were able to preserve for a long time an almost complete autonomy in the midst of feudal surroundings. Their successes were owing in part to the occasionally favorable attitude of such rulers as the Kings of France and the Counts of Flanders. Philip Augustus, for example, supported the development of the *communes* in France with the express purpose of holding his nobles in check. In the early stages of their independence these *communes* granted a share in the local government only to such inhabitants as had coöperated in their enfranchisement; but after the middle of the thirteenth century a more liberal policy prevailed. By that time Ghent, Bruges, Lille, Ypres, and Douay had begun to exert a preponderating influence on the government of the whole of Flanders. In these municipalities, as at Milan and Venice in the same era, the aristocratic and reactionary forces not infrequently gained an advantage over the democratic and progressive. The guilds of artisans in the Flemish cities, however, continued to maintain a steady resistance against all encroachments on the rights of the people, and in the early years of the fourteenth century democracy appeared to be firmly

established. Under the leadership of Jacob van Artevelde, Ghent endeavored to form a confederacy of the towns and cities of Flanders, but he was slain in 1345, and the defeat and death of his son in 1382 prevented the triumph of the popular cause.

Nearly two hundred years later the northern provinces of the Netherlands succeeded in establishing a self-governing confederacy through the heroism of the burghers of Harlem, Leyden, and other Dutch towns and cities. That in the meantime the spirit of liberty had been kept alive throughout the realm, north and south, many events bear witness. In 1477, for example, delegates from Holland and other provinces, meeting with the representatives of Flanders at Ghent, the center of Flemish industry and commerce, had obtained from Mary of Burgundy the Great Privilege, which included the stipulation that no taxes should be imposed on the people without their consent. In 1539 Ghent had resisted the exactions of the Emperor Charles V, who had inherited the Netherlands from his grandmother. But it was only after the Emperor's son Philip had assumed the government of the provinces in 1549 that autocracy and excessive religious zeal on the part of the ruler roused to fury the independent and democratic spirit of his subjects. After several unsuccessful attempts to restore order Philip II appointed the Duke of Alva military dictator of the Netherlands in 1567. Alva's policy of crushing all opposition by a display of extreme cruelty proved a failure. Holland and Zeeland, encouraged by the success of the Dutch mariners in encounters with the Spaniards, in 1572 offered the command of their military forces to William the Silent, Prince of Orange. Accepting the offer, he directed from Delft their resistance to the attack of the Spanish troops. Harlem was subjected by the royal army to a prolonged siege in the winter of 1572-1573. Its defence, though heroic, proved ineffectual, and the townspeople as well as the garrison were cruelly punished for their defiance. Alkmaar was more successful in withstanding the onslaught of the enemy. Through the utmost hardships, stimulated and supported by the skill and tenacity of the stadtholder, Leyden stood stubbornly at bay behind

her fortifications. When at last the siege was raised, the city commemorated its victory over tyranny and intolerance by founding the University of Leyden, soon to become famous for its contributions to jurisprudence, philology, medicine, natural and physical science. The southern provinces were finally induced to submit to the control of Philip. In 1581, however, the seven United Provinces of the north declared their independence, which they continued to maintain in spite of the assassination of William the Silent at Delft in 1584.

Recent sketches of the development of democracy, as we understand it today, pass lightly over the part played by Berne, Zürich, and Lucerne in the early history of the Swiss Confederation, and by London in the prolonged struggle between the English Parliament and the Stuart kings, but lay particular emphasis on the progress brought about in government by the Industrial Revolution, "the deadly and persistent enemy of medievalism in politics and society," as one writer calls it. As late as the beginning of the nineteenth century, it is maintained, real democracy did not prevail in any country in the world, and only England, France, and the United States had made notable progress in that direction. These countries, which were the first to adopt the principles of modern democracy, were also the first to experience the transformation of national life brought about by the introduction of modern methods of manufacture and transportation; while Germany and Russia were retarded both in their industrial and political development. In France and in America the triumph of democracy had been precipitated by the opposition of autocratic rulers. In both of these countries political revolution had been organized by members of the professions, by merchants, and other representatives of the middle classes. In the French Revolution and the American Revolution a part had been played by distrust of the absolutist tendency of state religion, sharpened, in the one case, by the scientific spirit of the *éclaircissement*, and, in the other, by the influence of the Puritan tradition. In the one country, according to Professor Aulard, there came into being, with a promptness

that suggests a revival of communal France of the twelfth and thirteenth centuries, numerous independent municipal republics, which were soon brought into national unity under the auspices of the Commune of Paris. The democratic movements of 1830, 1848, and 1871, which followed the beginning in France of the Industrial Revolution, were, as Lord Bryce notes, the work of the capital rather than of the nation as a whole. In the other country, the comparative absence of social inequalities and prolonged experience in the practice of political freedom had converted the original colonial settlements into democratic commonwealths, capable of entering into coöperation with one another.

The advance of democracy in Great Britain was checked for a time by national opposition to the claims of the American colonies, by reaction against the excesses of the French Revolution, and by the effect on public sentiment of the Napoleonic wars. When, however, further political progress occurred in spite of these setbacks, it was largely in response to the demands of organized labor in the towns and cities. In 1824 and 1825, through the efforts of Francis Place and Joseph Hume, trade unionism, which now numbers its adherents by the million in the United Kingdom, Germany, the United States, and the other highly civilized countries of the world, was given definite legal status by the British Parliament. The Reform Acts of 1832, vigorously supported by the trade unions, increased the political power of the middle classes and added the upper stratum of the manual laborers to the number of electors. The Chartist movement, which was maintained almost wholly by workmen, anticipated by a few decades the regular program of British democracy. Property qualifications for members of Parliament were abolished in 1858. The Reform Acts of 1867 and 1868, promoted by the London Trades Council and by numerous provincial trade organizations, extended the franchise to all householders in towns and cities. The Ballot Act became law in 1872. The Franchise Acts of 1884 and 1885 granted the suffrage to miners and agricultural laborers. After the general elections of 1906 the trade unions were represented in the Commons by twenty-nine

members organized as an independent Labor Party. Their influence immediately made itself felt in acts regulating trade disputes and securing an eight-hour day for miners, as well as in other progressive measures. After two general appeals to the country in 1910 the party strength was increased to forty-two, and acts were passed to provide for the payment of members of Parliament and to fix a minimum wage for miners. During the Great War the Labor Party was represented in the coalition cabinets of Asquith and Lloyd George. In the general elections following the enactment in 1918 of the Representation of the People's Bill, which added to the voters' lists the names of two million men and seven million women, the Labor Party established its claim to recognition as the official Opposition. Every expansion of the franchise in Great Britain from 1832 to 1918 was accompanied by a reallocation of seats which gave proportionate representation to the rapidly growing towns and cities.

In Germany, representative government responded less readily to the demands of the industrial and commercial centers. In 1871 it was decided that the total population of the Empire should be divided into constituencies of one hundred thousand each, and that every constituency should be entitled to one representative in the Reichstag. The Industrial Revolution, which by that time was making rapid headway in Germany, brought with it, as we have seen, a characteristic increase and redistribution of the population. But, under the imperial régime, there was no corresponding redistribution of seats in the popular assembly. Before 1914 many of the rural constituencies, conservative and reactionary in their political tendencies, had decreased in population by tens of thousands; while many of the urban constituencies, liberal and progressive in politics, had increased by hundreds of thousands.

REFERENCES — Aulard, A.: "The French Revolution and Napoleon" (in *Modern France*, edited by A. Tilley, 1922); Barnes, H. E.: "The History of Democracy," *Ency. Am.*, 1925; Brown, I.: *The Meaning of Democracy*, revised ed., 1926; Bryce, J. (Lord): *Modern Democracies*, 1921; Croly, H.: *Progressive Democracy*, 1914; Hobhouse, L. T.: *Liberalism*, 1910; May, T. E. (Sir): *Democracy in Europe*,

1877; Rose, J. H.: *The Rise of Democracy*, 1897; Scherger, G. L.: *The Evolution of Modern Liberty*, 1904; Wallas, G.: *The Life of Francis Place*, revised ed., 1919; Webb, S. and B.: *The History of Trade Unionism*, revised ed., 1920. See also the article on Joseph Hume in the *Dictionary of National Biography*.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That in ancient, medieval, and modern history the development of democracy has depended in the main on the growth of the larger towns and cities.
2. Describe the rising middle classes — professional, mercantile, artizan — in the English towns of the fourteenth century as portrayed by Chaucer in the Prologue to the *Canterbury Tales*.
3. Give an account of the struggle for independence of the city of Ghent in the fourteenth century, laying emphasis on the influence of the craft guilds.
4. Show the part played by the *communes* in the French Revolution.
5. Write a biographical sketch of Joseph Hume, M.P., showing his relation to the development of the trade unions.
6. Who were the Chartists? Who formulated their demands? Explain exactly in what sense these demands were *premature*.
7. What are the chief provisions of the Equal Franchise Bill of 1928? What are the objections to the passage of this measure?
8. Why was there no redistribution of seats in the German Reichstag from 1871 to 1918?

XVI

FREEDOM IN SCHOOL AND COLLEGE

The nature of a child's education must depend in part on the political organization of the state in which it is reared. For example, Sparta, a conservative city-state of landowners, almost without trade and manufactures, was forced to develop a style of training different from that of its comparatively democratic rival, Athens. The former, a Dorian garrison, isolated in the Peloponnesus among subject peoples, could not relax for a moment from an attitude of vigilant self-defense. No infant that had not a good physique was permitted to live. From childhood the training of the boy was almost wholly military. Conversation heard in the earliest years, as well as later, was designed to form the soul of a warrior. Education was of necessity stereotyped. The boarding school, or barracks, for which the boy left home at the age of seven, sought to eradicate all personal and family traits and to implant the essential characteristics of Spartan citizenship. The individual was completely subordinated to the state. No luxury in food or dress was allowed. Games were so organized as to contribute to the supreme social purpose of self-preservation. The predatory and fighting spirit was kept alive by hunting, wrestling, and rough-and-tumble scrimmages. The Spartans in spite of their notable physical fitness made little concession to the claims of the esthetic. Their dancing in the main consisted in musical drill; their music was composed of martial strains, or formed the accompaniment of a recital of the city's laws; their songs celebrated the deeds of Spartan heroes. The character of the young was the constant care of Spartan education, but the morals inculcated were those of the citizen soldier in time of war. The purloining or appropri-

tion of supplies and the murder of such Helots as might be thought dangerous to the state were connived at or actively encouraged in order that nothing should be wanting in the training of the perfect warrior. At the time of the culmination of Athenian culture the Spartans were almost wholly illiterate. They believed in deeds, not words, and, having little culture to transmit, they were able to dispense with professional teachers.

Commerce and other forms of intercourse had brought the Athenians into contact with alien peoples and had widened their intellectual horizon. From our point of view the fact that in thought and in politics they were more progressive than the Spartans makes them more typically Greek. They relied more on reason and were less tenacious of traditional beliefs and practices. The time, method, and content of the education of the children were determined by the parents rather than by the state. The schools of Athens were day schools, not boarding schools. Nevertheless, in this busy center of trade and commerce, as in the Lacedæmonian garrison town, the development of character was considered the essential thing in the education of the young. The child's mother and father, nurse and attendant, combined to teach it what to do and what not to do, what is just and what is unjust, what is beautiful and what is ugly, what things are holy and what unholy. The inclusive virtue was to be a good citizen, skilled to govern as well as to fight and to obey. Even the humblest citizen was given the opportunity to develop his political and ethical judgment as a member of the public assembly and as juryman and justice in the law courts. He had a voice in the control of the foreign and domestic policy of the city-state. It was to his esthetic judgment that Athenian architects, sculptors, orators, and dramatists made their appeal. For such citizenship as Athens required, training in literature and art, as well as in athletics, was indispensable. The Athenian ideals of health, beauty, and wisdom were closely interrelated. Physical perfection was esteemed not merely on account of its value in war, but also because in an intimate sense the control of the body, poise and good form, must be

regarded as an index of character. Music and the other arts exercise, the Athenian philosophers recognized, a similar formative influence. Athenian ethics indeed, paying homage to grace of character and to the beauty of moderation and virtue, was not unrelated to esthetics. As regards democracy Athens, of course, like medieval Venice and Florence, fell far short of the ideal, its real citizens forming a minority of the total population. The devotion to the gods and to the commonwealth of these privileged Athenians, on whom the stability of the city-state depended, eventually gave way before the criticism of a sophisticated age.

Some resemblance may be found between the training of Athenian citizens in antiquity and that of the English directing classes today — a similar wholesome emphasis on character, a similar recognition of the importance of athletics and good form, and a similar faith in the value of beauty. Eton, Harrow, Winchester, Rugby, Shrewsbury, Charterhouse, Westminster, St. Paul's, Merchant Taylors', and other so-called public schools, have played a significant part in preparing for public life Great Britain's viceroys, governors, generals, admirals, statesmen, judges, bishops, heads of colleges, and other representatives of the ruling and governing classes. These institutions have for generations been credited with an important share in the triumphs of British administration at home and abroad, for they have maintained a lofty standard of public spirit and devotion to the interests of the empire. The English public schools, under the influence of such masters of the theory and practice of education as John Locke and Thomas Arnold, have long accepted the view that culture must be gained not merely through books but also through social intercourse and that by participation in the corporate life of the school the pupil finds an excellent opportunity to extend his experience. A group of gentlemen's sons, classified according to their advancement in scholarship, organized for athletics, the older and abler entering into consultation with the headmaster, and coöperating with him and the other masters in the control of the younger and more unruly pupils, may be regarded as an epitome of a well-gov-

erned realm. That these public schools, which have fulfilled so splendidly the purposes of their staffs and patrons, should now be under criticism is indicative of the development in Great Britain of a new social and political spirit.

Within the last few decades especially, the nation's complacency in the wisdom of its rulers and in the adequacy of their training has been considerably shaken. One recent writer ascribes all the blunders of the past twenty-five years in British diplomacy and statecraft generally, as well as in naval and military strategy, to the defective education of the chosen few who govern and lead. A second critic states rather bitterly, in an English periodical, that public school and university education, despite its admirable results in the hunting field, is in need of a little altering. Compton Mackenzie in one of his novels contributes what appears to be a highly satirical account of education at St. Paul's and Oxford. Galsworthy in *The Forsyte Saga* describes a Victorian cricket match between Eton and Harrow in the presence of the six thousand top hats of the *beati possidentes* and the four thousand parasols of their wives and daughters, and laments ironically the good old days before the advent of modern democracy. In the judgment of other critics the training given in the great English public schools has failed to keep pace with the nation's social and political progress. The culture they seek to impart is aristocratic rather than democratic, national rather than cosmopolitan, exclusive rather than inclusive, sectarian rather than humanitarian. It is made clear that the majority of the great English public schools are under sacerdotal influence and control; the cultivation of the imperialistic spirit is a matter of special pride among the masters and patrons; the study of modern science is slighted; boys of the class for whose benefit some of these institutions were founded are less welcome than their superiors in rank and wealth. The principles of self-activity and coöperation have been brought to bear less consistently on the intellectual training than on the physical. The curriculum has failed to respond to the social needs of the present. An overemphasis on the cultural tradition fits the pupils

to become effective members of a stable but not of a progressive society, to undertake the duty of perpetuation but not that of reconstruction. The democratic critics of the English public schools maintain that the growing complexity of modern civilization demands of the cultured an ever wider range of social sympathy and adaptability, and that British youth, while keeping touch with the past and becoming habituated to the present, must be permitted to retain such a degree of plasticity as may prove indispensable in the future.

The universities of Germany under the imperial régime offer an apparent exception to the rule that the education of a people corresponds to its social and political organization. Upon entering the university the German student, destined to become a member of the directing class, began his self-education; and, as Professor Paulsen remarks, freedom is the necessary condition of self-education and culture. The German student had no prescribed textbooks; he was under no obligation to attend lectures; no undue sense of loyalty bound him to one institution for three or four years, but he moved freely from place to place wherever his interests might lead him. He had no examination to face, as a rule, at the end of the semester or the end of the year. If at the close of his student days he went up for a degree, the oral examination was a purely secondary matter and the questions asked did not necessarily depend on any particular course of lectures he might have attended. The chief part of the final examination was a thesis on a subject selected by the candidate himself. This tested his ability to do original scientific work in his own field, and to assume an independent attitude toward whatever he had heard or read. "The German university," exclaimed Stanley Hall more than thirty-five years ago, "is today the freest spot on earth." Here were selected the national leaders whose sense of public responsibility was developed under these unique conditions. The university instructors were appointed on the score of original contributions to the advancement of knowledge. For more than a hundred years it had been the established practice of German professors to lec-

ture solely on the results of their own investigations, freeing themselves as far as possible from political, economic, social, and ecclesiastical prepossessions. That some proved unable to maintain an attitude of strict scientific impartiality was not on account of, but in spite of, the German academic tradition.

One is tempted to say that imperial Germany had an autocratic government and a democratic university organization, and that the United States has a democratic government and an autocratic university organization. But many writers assert that the American republic is governed by powers not truly democratic, and that, consequently, there is no real antithesis between political and university control. They maintain that in the United States the same heavy hand is laid on the colleges and universities, the churches, the newspapers, the means of transportation, the mines and oil fields, the mills and factories, and on the helm of the ship of state. They undertake to prove that the same individuals compose the boards of directors of the great business corporations of the country and sit on the trustee boards of American institutions of higher learning, where they are the predominant power. Wealth pays the piper and calls the tune. Calmer voices also proclaim the undue influence of the rich in academic circles. The most eminent professor of philosophy on the American continent, after speaking of the direct dependence on wealthy men of the universities of the United States, declares that his colleagues refrain from expressing views which might alienate the class of persons upon whom the material development of these universities most obviously depends. From another quarter we learn of the endeavor of the universities to avoid giving offense where favors are desired or anticipated. Thus the mere possession of wealth, without any actual benefaction, may make an unschooled man of property more potent in directing the educational policy of a university than the most scholarly and public-spirited member of the faculty.

It is not strange that in these circumstances charges of the abuse of academic freedom on the part of the university professor are seldom dealt with justly and are never referred for consideration

and judgment to his peers in the realm of science. Views concerning the rights of the laborers in the steel mills or the mines, concerning the income tax, free trade, the municipal ownership of street railways, or government control of hydro-electric power, if they seem hostile to the interests of the university patrons, actual or prospective, may be stigmatized as partizan or held to justify dismissal without trial or explanation. Not infrequently the fallacy is put forward that it is the sole business of the university instructor to pursue truth for truth's sake. In defiance of logic, philology, and the history of education, it is asserted that a *professor* is primarily a scholar. If the professor's influence threatens to extend beyond the walls of his classroom, he may be warned of the danger and the loss of dignity of becoming a publicist. "Culture moves by the force, not merely or primarily of the scientific passion for pure knowledge, but also of the passion for doing good." If this impulse be choked at the fountain-head, what wonder the students turn from a stagnant learning with an indifference which university presidents bemoan but cannot cure? But, they say, if the university is wise to tolerate, the professor is wise to be severely moderate and master of himself. Waiving consideration of the assumption that the university is an entity independent of the professors and the students, one is forced to inquire if it should not do more than merely tolerate the best informed and most disinterested leaders of public opinion.

In English-speaking countries, says Principal Barker, the final authority of the state is not an enemy of the freedom of the university. A much more dangerous enemy is social interests, especially when they are backed by the power of cash, for finance determines policy. England cannot but feel abashed at thought of the splendid gifts of wealthy Americans to higher education. "Yet," he proceeds, "there is some reason for the feeling that, in modern democratic communities, there is a limit to the extent to which private benefaction can safely endow universities. Universities are great public institutions. They belong to the general commonwealth. They cannot be proprietary. They cannot be sec-

tarian. They must be above even the suspicion of belonging to one or other side in our social cleavage. They belong to both. A university which relies to any great extent on private benefactions may tend, however unconsciously, to teach and to preach acceptable things; and that is the greatest offence which it can commit against the spirit of truth. To take benefaction if it comes, but not go out to seek it; to look even a gift-horse in the mouth with a modest and discreet inquiry; to be sure that no endowment contravenes by one jot or tittle freedom of inquiry or freedom of expression — these are the natural policies of a university which respects its own genius of academic freedom. I would not exaggerate the dangers of private benefaction to universities. Often and often it is the fruit of plain and unconditioned generosity. But I would not be blind to the possible dangers. And it is always possible that private benefactions may have their tacit implications — a form of capitalism; a particular kind of nationalism; some brand of confessionalism — which may make them enemies of academic freedom.”

Fortunately, the tactful recognition of the spirit of freedom in the classrooms of certain American schools and colleges, as we learn from the writings of the late Colin Scott and others, is bringing about a change of very great social significance. It means much more than the emancipation of the instructor. It implies a modification of the examination system, a curtailment of the lecture method, and an abatement of dogmatism. The lines of attention are no longer focused on a single personality. The cathedra is no longer regarded as the source from which all light and energy emanate. Students are learning to replace task work by self-initiated activity of a scholarly sort. Their genius for organization, long exercised in sport and other forms of recreation, is now directed toward cultural ends. Increased freedom is supplemented by an increased sense of responsibility. Practised in discussion and habituated to coöperation, students are obtaining the intellectual and ethical training essential for the citizens of a progressive commonwealth.

REFERENCES — Baker, R. S.: *Woodrow Wilson, Life and Letters* (vol. II, chapter xvii), 1927; Barker, E.: "The Nature and Conditions of Academic Freedom in Universities," *Report of the British Association for the Advancement of Science*, 1924; Dewey, J.: *Democracy and Education*, 1916; Flexner, A.: *A Modern College*, 1923; Judd, C. H.: *Evolution of a Democratic School System*, 1918; Roman, F. W.: *The New Education in Europe*, 1923; Russell, B.: "Educational Tyranny in America," *The Nation and Athenæum*, 1924; Scott, C. A.: *Social Education*, 1908; Sinclair, U.: *The Goose-Step*, 1923; Wells, H. G.: *The Story of a Great Schoolmaster*, 1924.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the methods employed in the average American college classroom are likely to produce successful public leaders.
2. Discuss the view that an American institution of higher learning is composed essentially of professors and students. "A university consists of students and teachers." (Woodrow Wilson)
3. Is a professor primarily a discoverer of the truth or an exponent of the truth?
4. Explain the statement that freedom is a necessary condition of self-education and culture. What do the Germans mean by the terms *Lehrfreiheit* and *Lernfreiheit*?
5. Review C. A. Scott's *Social Education*, stating whether in your judgment the principles he develops are applicable to American colleges and secondary schools.
6. Compare the secondary schools of imperial Germany with the secondary schools of the United States, indicating the degree of freedom granted in each of these two types of school to the development of individuality.
7. Compare the number of students in attendance at the colleges and universities of the United States with the number of pupils in attendance at the English secondary schools, and discuss the view that the greatest educational need of England is a system of free public high schools. (For data on English education see the *Ency. Brit.*, 13th edition.)

XVII

THE ETHICAL AIMS OF EDUCATION

Education has been described as the oversight and guidance of the development of the immature with certain social and ethical ends in view. The growth of personality, though it is sometimes compared to the free unfolding of a plant, is always subject to restriction and direction. Parents, teachers, and others engaged in practical educational work, take account both of the natural aptitudes and of the probable social destiny of the child. They observe and at the same time direct its growth. The intellect, feelings, and volition of the developing individual are influenced by the customs and conceptions of the community, even to the extent of being at times brought into almost complete conformity with them. Among the most highly civilized peoples, as we have seen in part in the chapter immediately preceding, different types of educational institution, discipline, curriculum, and method of instruction are required to prepare for citizenship in a monarchy, in an oligarchy, and in a democracy. Among the more primitive peoples the youth are carefully trained to honor their parents and to hold in reverence the tribal traditions. Closely corresponding to — if not, indeed, coincident with — the political and social aims of education, are the purely moral and ethical. The moral character of a person is ultimately formed through participation in the vocational and other serious activities of the society of which he is a part, and through the accompanying exercise of social insight and appreciation. It is natural, therefore, that pedagogy, or the scientific theory of education, should depend not only on genetic psychology, which studies the raw material on which the educator undertakes to practise his art, but also on social psychology, sociology,

political science, and ethics, which indicate more or less clearly the form and pattern of the finished product.

Integrity, the result of harmonizing inborn with acquired tendencies, becomes potent as a principle and criterion of moral character as social experience increases in scope and intensity. At the approach of adolescence the consciousness of accumulating responsibilities to family, to friends, and to society in general, is likely to be particularly aroused. Referring to this critical period Rousseau, in his famous essay on education, says that every human being is in a sense born twice. Man first exists as an animal, and only later lives as a member of society. It is through the social rebirth that he is really brought to life. Henceforth, nothing human is altogether hidden from him. The youth's feelings and imagination once enkindled, all his relations to the species, all his affections awake. His first profound passion acts as a ferment on the whole range of the social sentiments and volitions. The approbation of those dearest to him increases his desire of general approbation. This stimulation of the social interests at the adolescent age, of which Rousseau speaks, is a well-nigh universal phenomenon, though it may manifest itself in a great variety of ways. It is not confined to any one sect or to any one race. Its significance for social well-being is recognized by educative rites and ceremonies among peoples of all grades of culture throughout the world. Even among the savages of Africa and Australia the youth are initiated in mysteries designed to impress upon them certain modes of behavior as members of the social group. If the adolescent, either in savage or civilized surroundings, disregards the obligations which his bodily growth and increased mental powers entail and fails to do what is right and fitting, the disapprobation of the community to which he belongs stirs and reinforces in him a sense of self-condemnation. Atonement can be made and integrity of character can be established only through the voluntary fulfilment of social duties.

Good-will to all men may be accepted as the essence of virtue, provided that it finds expression in deeds and habits and does not

rest content with an intellectual and emotional recognition of the rights of others. Both the golden rule of the religious teacher and the moral imperative of the practical philosopher interpret virtue in social terms and lay upon all the injunction to act in accordance with principles that have universal validity. A society of men of good-will, in the judgment of Kant, is one in which the individuals enter into coöperation in the maintenance of peace and freedom. To this end justice, which has regard to the good of all, is no less requisite than benevolence. In fact, a too exclusive emphasis on private benevolence, as if it were the mainspring of virtue, is characteristic of civilizations that fail to make ethical insight effective in political action. Such natural propensities as are injurious to an advanced stage of culture must be suppressed. Leniency to social enemies should be shown only in so far as it is compatible with the welfare of the community. Justice forbids connivance at the spoliation of the helpless by the cunning and powerful. Persistence in the cause of human progress deserves to be placed — with integrity, good-will, benevolence, and justice — among the modes of conduct that education seeks to inculcate. It stands opposed to the dull sloth (*accidia*) described by Dante in the *Inferno* and the *Purgatorio*. It includes all that has been preached and practised in the name of the strenuous life. It implies faith in the betterment of society, the courage of one's convictions, and insistence on making the right prevail.

Though we are not convinced that the clarification of ethical concepts and the establishment of certain social inhibitions by means of a series of negative commands (such as the decalogue) are matters of indifference, these are not the chief contributions of educational institutions to the development of character. Even if we believe that the best method of teaching a boy to swim is not to throw him uninstructed into the water, in a sense it is true that, as Professor Dewey says, the only way to prepare for social life is to engage in social life. The well-organized school carries a step further the socialization of the individual begun in the home. It is a representative community, which affords opportunities for social

intercourse, gives practical recognition to the principle of the division of labor according to diversity of talents, and encourages among pupils and teachers concerted efforts toward worthwhile ends. Personality expands in response to the stimulation of the group, the collision of personality with personality leads to the development of mutual forbearance, and the social feelings and the social imagination are enlivened. Intelligence and self-activity are cultivated in the classroom as well as on the playground. Here, as in the business world of today, competition is gradually yielding place to coöperation and team-work. Increased consideration is shown to the views of others, and discipline is controlled by group sentiment. History, literature, and other studies are employed to supplement the personal experience of the pupils and to introduce them to the life of society in general.

Modern pedagogy repudiates the sharp distinction which has frequently been made between instruction, or the imparting of information, and education, or the regulation of conduct — a dichotomy which has blinded educators to the need of reforming school curricula and classroom methods, has belittled the activity of the teacher and exalted that of the administrator, has minimized the importance of work and magnified the importance of play. Ignorance arrests the development of the moral character of the individual and is a menace to the progress of society. Culture and sound judgment depend on information. "The best thinkers in any field," says Bernard Ewer in his *Applied Psychology*, "are those who know most about the subject, usually because they have equipped themselves for dealing with it by long and arduous study. Scientific discoveries are made by scientifically trained men. Business and political problems are solved by those who have the broadest acquaintance with their various aspects." Granted that sound judgment in general depends on the acquisition of a stock of reliable information, what sort of knowledge is most desirable from our present point of view? Under the conditions of contemporary civilization what should the schools endeavor to impart as the basis of social judgment and moral character?

It is essential that school studies should impress upon the young the social significance of work. They should give a comprehensive view of the development and interdependence of the everyday occupations. Through study the young must gradually acquire an appreciative and well-proportioned knowledge of the activities, needs, and purposes of the husbandman, shepherd, carpenter, fisher, merchant, physician, teacher, and other representatives of the industrious class, whose labors have served to illustrate the principles and to suggest the ideals of practical philosophy and religion, and from whose ranks in the main have been drawn the world's greatest seers and prophets. This knowledge of the essential and vital necessities of society should be made the nucleus of all later acquisitions. It is an indispensable condition of the choice of a vocation, through which the individual establishes a business relationship with the life of his time. It humanizes the study of the sciences by explaining their origin, development, and interrelations, and by indicating the importance for social progress of their methods and results. It throws light, as we shall see in later chapters, on the development of politics and art. In fact, an intelligent and sympathetic interest in the serious occupations of men, in their struggles, perplexities, and aspirations, is a clue to the different phases of civilization and is at the same time a means of personal regeneration. The process of socialization is seldom if ever complete, but we may suppose that by men and women of the noblest type of character all things knowable are ultimately seen in perspective as parts of a harmonious system luring the individual from his egoism but strengthening his personality.

In the endeavor to impart to his pupils a certain permanent direction of thought and action, the instructor should never lose sight of the degree of their responsiveness. He should take pattern after distinguished authors, who must be counted among the successful teachers of mankind. Literary style has regard to the nature of the audience addressed, and varies with the personality of the writer. Accordingly, literature cannot dictate a teacher's style or method of instruction, which must be developed rather than

acquired, but it offers a great diversity of suggestive models. Herbert, having in mind the need of the instructor to base his work on the spontaneous interests and native inclinations of the pupil in order finally to inculcate a system of ethical principles, remarks that popular poems do not as a rule produce their effects by teaching something new, that the great writers' method of developing a subject consists in a scarcely perceptible, or at least an always easy, advance, that they dwell long on the same idea, but achieve little by little the most powerful contrasts, that they avoid monotony by never standing still entirely, and that they seldom take sudden leaps. At the same time he is not unaware that in skilful teaching as well as in great literature an unexpected transition is not invariably amiss, for youth are exhilarated by an opportunity to jump and climb. The nature of rhetoric is, indeed, so protean that we must beware of placing undue emphasis on any one quality of style. "Teachers quite commonly proceed on the fallacious and very mischievous assumption that, because their mode of expression is clear, it will of course be understood by the pupil." In other words, instructors take it for granted that clearness and simplicity of style are identical, when, as a matter of fact, clearness is opposed to obscurity, and simplicity to abstruseness. The first is absolute, and the second is relative. Teachers of great perspicacity in their own particular field not infrequently fail to realize that a statement perfectly simple to them may be extremely abstruse to their pupils. Moreover, if the stimulation of the imagination lies within the province of the teacher, even obscurity of style, judiciously employed, is not without educative value.

Instruction, through the development of social ideas and ideals, leads from discipline to self-discipline. Discipline, or the control of the immature by the will of others, in a sense hardly deserves to be called education; it is rather comparable with the breaking-in of a colt. Nevertheless, it is an essential part of the child's training. Care must be taken to protect him from injury in early years, though it is impossible to guard him from every mishap without robbing him of the chance of free development. If he is unruly, he

must be restrained until he learns to govern himself. It is the duty of the parent and teacher to bring the child under control, since it is better for him and all associated with him that he should be governed by the ideas of others rather than that he should not be governed at all. He may be held in check by ministering to his need of physical and mental activity, by a show of parental love and authority, by disapprobation commensurate with his offense against the moral code, and by appropriate chastisement. The transition from discipline to self-discipline is as a rule gradual. The four years preceding the dawn of adolescence give special opportunities not only for drill and regimentation but also for participation in the activities of social groups beyond the confines of home and school. With the coming of adolescence the rapid growth of the sense of social responsibility involves a correspondingly rapid transition from discipline to self-discipline. In the case of the mentally defective and of a considerable part of the criminal class, this transition can never take place. Here constant vigilance is required to secure anything like conformity to the conventional standards of civilized society. Defectives and criminals must, like young children, be made to submit to the code generally recognized by society. But in the particularly gifted, well-educated youth of the most highly developed peoples lies the hope of the advancement of the law, the reinterpretation and sublimation of social traditions and customs, that is, of the evolution of morality itself.

Conscience is originally, says Friedrich Paulsen at the conclusion of a brief statement of his ethical doctrines, nothing but the knowledge of custom. The individual knows what mode of behavior, under given circumstances, is enjoined upon him by custom. How he *ought* to behave has been impressed upon him by his education, by the opinion of society concerning what is right and wrong, by laws and punishments, and, finally, by religious commandments. He compares the reality with this obligation, this norm which is always present and absolutely binding; it admonishes him, it impels him, it warns and punishes. The obligation is

not something foreign to his will; he himself wills that the norm be valid, that custom be obeyed; he invariably demands that others yield it obedience; indeed it is his will that the community, the historical organism to which he belongs, should preserve itself and live. In spite of all this, however, the loyal acceptance of the conventional standards is not the last word in morality. "Conscience assumes another form on a higher stage of development." It is not merely the privilege, it is the duty of the rising generation to scrutinize ancient laws and standards in the light of modern knowledge. Strictly speaking, there are no immutable laws, or permanent standards, or inviolable customs. The old order changes. The ideal of the religious reformer is subversive of established custom. The more inclusive loyalties conflict with the more exclusive. When we say that education is the oversight and guidance of the development of the immature with certain social and ethical ends in view, we do not mean that these ends are fixed for all time. In the present state of civilization — complex, instable, progressive, subject to sudden changes of front — it seems particularly desirable that the spiritual forces should be kept mobile. The progressive leaders, while schooled in the best traditions and well informed concerning the conditions of their own time, should be allowed to retain a large measure of native adaptability in order that, unhampered by precedent, they may bring all their intelligence to bear on the difficult social problems that are sure to confront them.

REFERENCES — Dewey, J.: *Moral Principles in Education*, 1909; and *Human Nature and Conduct*, 1922; Everett, W. G.: *Moral Values*, 1918; Felkin, H. M. and E.: *Science of Education*, 1892 (translation of J. F. Herbart's *Umriss der Allgemeinen Pädagogik*, 1841); Marchant, J. (Sir): *The Claims of the Coming Generation*, 1923; Palmer, G. H.: *Altruism — its Nature and Varieties*, 1919; Paulsen, F.: *Introduction to Philosophy* (translated by F. Thilly, 1898); Perry, R. B.: *The Present Conflict of Ideals*, 1918; Sadler, M. E. (Sir): *Moral Instruction and Training*, 1908; Spiller, G.: *Report on Moral Instruction and on Moral Training*, 1909; Tufts, J. H.: *Ethics of Coöperation*, 1918.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That after the age of eighteen a student's prospective vocation should be made the center and nucleus of his cultural education.
2. Make a clear distinction between education from the psychological point of view and education from the sociological point of view.
3. What is the period of adolescence? Do you consider the age of adolescence the most critical time in the social development of the individual?
4. A well-organized school is a representative community, a social group affording opportunities for self-activity and spontaneous coöperation. Do our high schools and colleges conform to this standard?
5. In what sense and to what degree is the instruction of the high school and college character-forming?
6. Methods of instruction are as variable as literary style, or as personality. Does that imply that they cannot be taught or acquired?

XVIII

SOCIAL PROGRESS IN MORALS

“Belief in moral progress,” says Principal Jacks, “is a belief which no man can live without.” As regards the individual, it is a fundamental assumption in education, the supreme function of which, as we have seen, is to promote the development of the moral qualities. May it also be assumed in regard to society in general, some of the chief economic and political aspects of which will engage our attention in subsequent chapters?

That the so-called standards of public morality are undergoing continual change scarcely needs illustration. Pascal observed that they shift their nature with the latitudes, and Macaulay found them as variable as the fashions. Every stage in the evolution of social and political institutions entails a revision in the list of the virtues and vices and a redetermination of the order of their precedence. While the majority of Christian clergymen would still, no doubt, include pride and sloth among the deadliest sins, few modern teachers of ethics would on their own initiative select justice, prudence, temperance, and fortitude as the cardinal virtues. Ancient Rome, according to an eminent authority, produced many heroes, but no saint; and a like statement, though inapplicable to medieval Italy, may, without cynicism or censoriousness, be made concerning all the leading industrial states of the present day. The importance attached to reverence and humility during the Middle Ages seems utterly foreign to millions of English-speaking people of the twentieth century, when for the first time in history “aggressive” is used as a term of praise. Asceticism, also, is no longer in vogue; though the tendency of the Alexandrians of the early Christian era to confuse alms-giving with justice finds its parallel

in the tendency on this continent at the present time to accept benevolence as an ample substitute for all other virtues. It is evident that certain virtues and certain types of character are the outcome of this or that set of social conditions. The fact that variations occur so markedly in ethical standards and ideals is a reason for encouragement rather than the contrary if only we find sufficient grounds for believing in the general moral advance of mankind.

“The proposition for which I am contending,” says Lecky in his celebrated study of the moral progress of Europe, “is simply that there is such a thing as a natural history of morals, a defined and regular order, in which our moral feelings are unfolded; or, in other words, that there are certain groups of virtues which spring spontaneously out of the circumstances and mental conditions of an uncivilized people, and that there are others which are the normal and appropriate products of civilization. The virtues of uncivilized men are recognized as virtues by civilized men, but they are neither exhibited in the same perfection, nor given the same position in the scale of virtues.” There are, he proceeds, virtues very highly esteemed in a rude civilization which sink into comparative insignificance in an organized society, while conversely, virtues that are deemed secondary in the former become primary in the latter. In the development of morality it is true that personal prowess, fortitude, tribal loyalty, sense of honor, and other heroic virtues may be decreased, but diligence in peaceful occupations and the foresight and patience that accompany their pursuit, love of truth and respect for legal principles, tolerance, charity, and compassion, the amiable virtues and humane sentiments fostered by education, are notably increased.

“Can it be said, with respect to the benevolent and humanitarian sentiments,” wrote the author of a work in French on the evolution of morality, “that man has not progressed since primitive times? It would be folly so to maintain.” Professor Lester Ward declared himself unable to understand how any one could

read history without seeing this. The shocking acts that blacken the pages of the history of almost every country would not be possible today among any civilized people. Every student who is not temperamentally biased against the appeals of authority and reason must be appalled and overwhelmed by the evidence. What really civilized person can hear without a sense of horror that after the siege of Tyre by Alexander the Great two thousand of the defenders were crucified, six thousand others were wantonly slain, and thirty thousand of the inhabitants were sold into slavery? In the first Mithridatic war eighty thousand Italians, at the lowest estimate, were massacred in the Grecian cities of Asia Minor in a single day. We pass over the proscriptions and other cruelties of the Roman civil wars, the barbarities of the amphitheater, forum, and circus, the outrages of the Huns and Vandals, and Charlemagne's slaughter of four or five thousand Saxons in the name of religion. In the early part of the eleventh century the Emperor Basil II caused fifteen thousand Bulgarians to be blinded, an eye being left to the first man in every one hundred of his victims. When, at the close of that century, the Holy Sepulcher was captured by the Crusaders, seventy thousand Mohammedans and Jews were massacred within a space of three days. The number of men, women, and children slain in the early part of the thirteenth century by Jenghis Khan in Central Asia almost staggers belief. Tamerlane, among his other monstrous deeds, is said to have buried alive in 1402 a garrison of four thousand Armenians. After the middle of the sixteenth century one of the rulers of northern India pampered his elephants with rice, sugar, and butter, while his starving subjects were reduced to cannibalism. Akbar, the noblest of the Great Moguls, yielded to a hideous custom of the times by building into a tower the heads of his fallen enemies, and in 1568, after the taking of Chitor, massacred thirty thousand of the country people who had aided in its defense. As a further contribution to this brief chronicle of atrocities we have Cromwell's official account of the capture of Drogheda, the first of a series of massacres in Ireland. The garrison offered a brave

resistance. "Our men getting up with them, were ordered by me to put them all to the sword. And indeed, being in the heat of action, I forbade them to spare any in the town, and I think that night they put to death about two thousand men." We refrain from quoting the gruesome details of this confession, which is such as no intelligent person would dare make in face of the spirit that animates civilized society today.

In early society, as Westermarck observes, regard for the life and physical well-being of a fellow creature is, generally speaking, restricted to members of the social unit. A stranger is an enemy. Primitive man, hunter and fisher, regards literally as *fair game* such men, women, or children, as do not belong to his tribe. If they fall into his hands, he may do as he likes with them. To refrain from killing and eating a captive implies a degree of restraint to which in the midst of excitement not all savages can attain, as Parkman's frightful accounts of the cannibalism of the American aborigines bear witness. The cases in which pity and other considerations tend to mollify the more barbarous inclinations reveal the rudiments of a higher morality. The practice, for example, of holding prisoners of war for ransom is indicative of moral advance. Most interesting, however, of the exceptions to the rule that the sympathy of uncivilized man is confined to his own tribe is the practice of extending hospitality to strangers, and, on occasion, to declared enemies. "In the place of a brother stand the stranger and suppliant, to him whose intelligence has even a little range." The customs associated with the recognition of the guest-right — indispensable to the development of commerce — have been ascribed to curiosity, to self-regarding foresight, and particularly to superstitious beliefs concerning a possible bringer of luck or a messenger of the gods. But probably more dominant than any of these alleged motives is the natural sentiment of pity for a human being in distress. In this and similar feelings common to all mankind lie the foundations of a morality which requires only the guidance of enlightenment and experience to lead it far beyond the confines of tribal life and to insure the ultimate triumph of

what has been referred to in an earlier chapter as a law of nature and nations for the control of war.

From the evolutionary point of view, to enslave an enemy instead of putting him to death may be regarded as an act of virtue in the early stages of intertribal morality. In the eyes of the jurists of antiquity slavery was, in fact, condoned as a mitigation of the barbarity of war. Among the lowest savages it is not found as a regular institution. It has prevailed more among agricultural than among pastoral peoples, and the modern crusade against it, which has been counted as one of the most decisive steps in moral progress recorded in the history of civilization, was stimulated to a considerable extent by the development of industry in western Europe and in America after the middle of the eighteenth century. The Greeks in general, and especially the Athenians at the height of their culture, had shown themselves humane in the treatment of slaves. Within the Roman Empire the harshness of the slave-owners had been gradually checked by legal regulations and the civilizing influence of Christianity. In the British Isles the improvement of the condition of the servile class had come as an almost immediate result of the Norman Conquest. In the subsequent centuries the abolition of serfdom and villeinage in the foremost countries of the world was brought about through the precept and example of Churchmen, through the growth of towns and cities, and through other civilizing influences. But long before the last vestiges of the enslavement of whites by whites had been obliterated, the enslavement of millions of African negroes by Europeans had occurred as a sequel of the discovery of America. The advance of democracy, the philanthropy of the Quakers, the Methodists, and the representatives of the Evangelical movement, the consequent agitation against the unspeakable brutalities of the slave trade, and the emancipation of slaves in the British and French possessions and within the boundaries of the United States, helped to prepare the way for the recognition by all civilized peoples that no race is beyond the pale of human sympathy.

The moral progress of society, justly regarded as the essential

feature of the development of civilization, consists in the growth of the moral feelings and in the widening of the range of their application. In the individual, as has been known from antiquity, pity and other sentiments are readily modified by experience. They are liable to atrophy or hypertrophy. They may be refined and directed by education. Aristotle held that they may be assuaged and purified by art, a tragic dramatic performance, for example, serving — as do, let us say, the tragic realities of our great cities — to relieve the mind of worry over all lesser and purely personal ills. In the development of mankind, as in the development of the individual, periods of gross apathy and callousness are followed by periods marked by a high degree of social sympathy and humanitarian sentiment. But moral progress, as one of our older writers remarks, consists less in the increasing intensity and refinement of love, pity, sympathy, and mercy, than in the ever increasing number of persons to whom they have reference. It is not so much the warmth of our fraternal and neighborly sentiments that varies as the practical answer to the challenge, "Who are our brothers? Who are our neighbors?" Modern science and technology, by breaking down the barriers of space and time which separate one people from another, have contributed, no doubt, in a very large measure toward extending the range of social sympathy and coöperation.

The family as a social institution, regarded as the bedrock both of chastity (as the good effect of early marriages in Ireland proves it to be) and of morality in general, has undergone several stages of development. It seems clear that the morals of the men of the Old Stone Age were no less inferior than their intellectual acquirements, and that this general moral inferiority did not fail to show itself in their treatment of women and children. Among the primitive tribes of today, though sexual promiscuity as a substitute for the family nowhere exists, widespread license and laxity in marital relations are not exceptional. The characteristics of the patriarchal family, associated with the pastoral occupation, may be studied in the history of the Hebrews and other civilized peoples.

The Old Testament furnishes abundant evidence of the existence among the ancient Semites of polygamy and other primitive conjugal customs. Indeed, polygamy is known to have existed in the past among nearly all races. In one of its forms, polygyny, it has only recently been renounced by the Mormons, and at the present time it does not run counter to the principles of the Mohammedans; while in another form, polyandry, it is not infrequent in Tibet, in the mountains of India, and throughout the islands of the South Pacific. The general acceptance of monogamy by the most advanced peoples as the best basis of family life is thus seen to be one of the slow achievements of moral progress. The practice of securing wives by capture, of which in Europe the legend of the Sabine women preserves the memory, survives among a few primitive peoples, such as the aborigines of Central Australia. Marriage by purchase continues in its grossest forms in the Orient, and is accompanied by child marriage in British India, where nearly forty per cent of the native girls become brides before the age of sixteen.¹ In its subtler forms it still lingers, in spite of the diatribes of poets and novelists, among the most highly civilized nations of the world.

It must be conceded that in the course of its evolution the family, the necessary consequence of the prolonged helplessness of human offspring, has contributed no less to social stability than to social progress. Permeated even in its earliest stages by the spirit of sympathy and altruism, it has in many cases supplemented the care of progeny by care of the elders and concern for the souls of the dead. Among the Mongolians of Asia there has survived the custom of worshiping the family ancestors. Among other peoples the legendary ancestors of clans or tribes have been deified, and at times identified with the stars. Among the Hebrews every tendency, however, to ancestor worship or the cult of the dead was sternly suppressed by prophets and lawgivers. At the same time fatherhood and other family relationships were

¹ For a careful statement of the progress made in this field, see "Is India Dying?" A. H. Clark, *The Atlantic Monthly*, February, 1928.

idealized and generalized as mystic religious conceptions. If in some parts of the world the practice of adoption and the familiar treatment of slaves and dependents helped to overcome the exclusiveness of the family, in others the kinship group became a self-centered social institution, unprogressive and habit-ridden. In China today loyalty to kindred is a serious obstacle to the development of a more inclusive community consciousness. In the main, however, loyalty to the family group is the germ from which loyalty to society in general, or loyalty to moral principle, has grown.

Like the family, the tribe has served, notwithstanding the defects which imaginative writers would have us ignore, to promote morality and give scope to the social sentiments. It has been singularly successful in subjecting youth to the will of the group, impressing by rites and enforcing by punishments the necessity of submission to the tribal *mores*. The accumulated wisdom of the tribe, learned in the hard school of experience, is imparted at the adolescent age when susceptibility to moral instruction is keenest. Under the direction of the elders the youth learns to reverence the symbols of tribal solidarity and to accept the tribal judgment as to what things are sacred or forbidden. To suppress the vagaries of the individual by a system of prohibitions is, from one point of view, the very essence of moral training. From the point of view, however, of those interested in progress rather than in the maintenance of present conditions, tribal morality appears as one stage of development, in which the exercise of private conscience is unknown, and in the presence of which, without any infringement of the social code of the tribe, such abominations as parricide, infanticide, and cannibalism may exist. The significance of the tribe for human welfare lies in the fact that it leads to higher forms of social organization. "From clan morality, based on physical kinship, mankind has advanced or is advancing to a world morality, based on the ethical kinship of men. This is the one increasing purpose running through all history — the creation of a moral order embracing the whole human race."

REFERENCES — Hobhouse, L. T.: *Morals in Evolution*, 1906; Jacks, L. P.: "Moral Progress" (in *Progress and History*, edited by F. S. Marvin, 1916); Jones, G. H.: *The Dawn of European Civilization*, 1903; Lecky, W. E. H.: *History of European Morals*, 1869; Myers, P. V. N.: *History as Past Ethics*, 1912; Spencer, B. and Gillen, F. J.: *The Native Tribes of Central Australia*, 1899; Wake, C. S.: *The Evolution of Morality*, 1878; Wallas, G.: *The Great Society*, 1914; Ward, L. F.: *Pure Sociology*, 2d ed., 1909; Westermarck, E. A.: *Origin and Development of the Moral Ideas*, 2d ed., 1912-1917.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That man has not improved morally in the last two thousand years.
2. Write a review of Parkman's *La Salle and the Discovery of the Great West*, recording your judgment of the state of moral advancement of the Indian tribes described in it.
3. (a) Are the most highly civilized peoples today more or less tolerant of cruelty than were the Romans of 80 B.C.? (b) Do you consider probable a recrudescence of the practice of cannibalism, or of the institution of slavery, or of judicial torture? (c) Are civilized peoples more or less responsive to the needs of starving or diseased multitudes in remote regions than were the civilized peoples of the eighteenth century? (d) Can we trace in the history of human society an evolution of the moral sentiments? Express yourself freely on these points.
4. Which of the great religions has in your judgment contributed most to the moral improvement of mankind? Discuss the claims in this respect of two of the other great religions.
5. Write an essay of three or four thousand words, showing the influence of the physical and natural sciences on morality in providing opportunities of mutual understanding and good-will among widely separated peoples.
6. Count Keyserling is recently reported as saying that man is biologically monogamous. Does the trend of history show that monogamy is also the moral ideal? What is Keyserling's attitude toward divorce, and toward early marriage. (Consult *Book of Marriage*, 1926.)

XIX

THE SOCIALISTIC IDEAL

Whatever its later character the revolt against capitalism, which cannot be ignored in an impartial survey of the vocational aspects of contemporary civilization, was in the first place moral and social. In the early part of the nineteenth century it had become clear that the watchwords and principles of the French Revolution did not control the relations of employers and employees, and that the dreams of religious idealists were still far from realization in the realm of industry. The almost incredible contrast between the splendor of the Hindu princes in the middle of the seventeenth century and the misery of their subjects, the contrast between the luxury of the French nobles in the middle of the eighteenth century and the destitution of the peasants, now began to be paralleled by the contrast between the wealth of the proprietors of factories and mines and the want of the wage-earners. It was held by many serious thinkers that modern economic conditions preclude the hope of rapid moral progress among the wealthy as well as among the poor, that the proverbial disadvantages of both poverty and riches still persist, that competency is preferable to superfluity or indigence, and that from the ethical point of view it has not ceased to be true that "they are as sick that surfeit with too much as they that starve with nothing." To more recent social reformers it appears that the whole industrial system is lacking in idealism. What is done by great corporations for the welfare of employees is not dictated primarily by philanthropic sentiment, but stands justified in the eyes of directors and shareholders on strict business principles. The profits of companies bear little relation to the real value of

their services to society, for those which cater to popular caprice are no less successful than those which minister to public necessity. Under the present system the ruin of one district or country may prove to be the prosperity of another. In certain circumstances the dearth of raw materials and foodstuffs may be counted an advantage and their abundance a disadvantage. Manufacturers may find it to their interest to hamper production, while farmers may be downhearted at the expectation of plenty or grow jubilant at the prospect of a general wheat shortage.

Claude-Henri de Saint-Simon, one of the forerunners of modern socialism, taught that human society should be so organized as to bring about as rapidly as possible the moral and physical betterment of the poor. Belonging to an illustrious family of French nobles which claimed descent from kings and emperors, he had entered the military service of his native land as a youth, had fought in the cause of freedom and equality in the closing campaigns of the War of the American Revolution, and had gained distinction at Yorktown at the early age of twenty-one. During his stay in America, Saint-Simon with characteristic boldness and public spirit advocated the construction of a canal to connect the Gulf of Mexico with the Pacific Ocean. After his return to France he took part in the political crisis of 1789, and incidentally improved his own fortune by land speculation. His ultimate aims were by no means personal. He dreamed of a new order of society in which the part that had been played in the direction of affairs by the privileged class to which he by birth belonged should be taken over by scientists and industrial experts. Though he was a champion of social reform on a fraternal basis, Saint-Simon had faith in the power of ideas and a scholar's sense of the continuity of civilization. A pupil of d'Alembert, the development of the sciences and the guidance of society by its master minds was a necessary part of his doctrine. The claims of merit must be acknowledged. All labor must contribute to the common good. Saint-Simon was for the workers and against the idlers. In 1814 he wrote a book concerning the reorganization of European society or the

necessity and the means of associating the peoples of Europe in a single political body while reserving to each its national independence. In the year of his death (1825) he published his most characteristic work — *Le Nouveau Christianisme* — in which he described a progressive religion applying its vital doctrines to modern social and political conditions. In fine, in the writings of Saint-Simon are indicated the outlines of an industrial commonwealth organized by science and associated with other commonwealths in the interests of peace, progress, and universal moral improvement. Among his numerous followers, who formed a distinct political and social group, the enfranchisement of woman and the recognition of her equality with man soon found advocates. The abolition of the inheritance of property was adopted as one of their aims. As regards the fundamental question of the rights of private property Saint-Simon accepted the idealistic, if not extreme, attitude of the Fathers of the Christian Church.

As early as the second century Tertullian had acclaimed the practice, current in some of the Christian communities, of having all things in common. St. Basil in the fourth century had demanded: "What is it you call yours? From whom have you received it? . . . How do the rich become rich, save by seizing those things which belong to all?" "The earth," he maintained, "is given in common to all men. Let no man call that his which has been taken in excess of his need from the common store, and which is kept by violence. . . . It is no greater crime to take from him who has, than to refuse to share your abundance with him who has not. The bread which you keep back is the bread of the hungry; the garment which you shut up belongs to the naked. The money you bury in the ground is the ransom and freedom of the wretched." "Nature," said his contemporary, St. Ambrose, "has made all things common for the use of all. . . . Nature made common right, usurpation made private right." St. John Chrysostom and St. Augustine spoke no less decidedly concerning the rights of private property, the former vehemently denouncing the accumulation of wealth as a crime against society. In the sixth

century St. Gregory the Great in a similar spirit discussed almsgiving, and asserted that, "When we share with those in need, we do not give them what belongs to us but what belongs to them. It is not doing a favor but paying a debt." It is evident from these fervent passages that the recognized exponents of the lofty ethics of the early Christian Church took much more literally than is customary at the present time those parts of the Old and the New Testament that deal with the evils of great possessions. Christian Socialists will find more ingenious than convincing the view that denunciation of the institution of private property was merely a weapon used by the Fathers of the Church to extort benefactions from the wealthy.

Robert Owen (1771-1858), who to a sense of the supreme importance of the moral welfare of the people added a practical wisdom gained through successful experience in factory management, was the first to comprehend the true relation between the modern means of production and the wage-earner. He had observed that wherever unrestrained capitalism held sway the demoralization of the employees followed, while the character of the manufacturer also was exposed to deterioration through the all-absorbing pursuit of gain. Wealth must not be allowed to sacrifice the morals and health of men, women, and children to the interests, real or supposed, of the manufacturing concern. The human being is more precious than the machine. In Owen's judgment no real and permanent greatness could be founded on the miseries of the poor. He would rather have seen the British cotton trade perish and the political prestige of Great Britain brought low than feel that they were upheld by the sacrifice of everything most valuable in life. His view that a man's character is formed for him and not by him had the advantage of giving an emphasis, much needed at the time, to the responsibility of society as regards the moral welfare of the workers and their offspring. If, he contended, an exchange of a certain number of new-born infants could be effected between a group of parents living in a well-to-do and religious community and a group of parents living in a poor and

vicious slum, "the children of the former would grow up like the members of the latter, prepared for every crime, while those of the latter would become the same temperate, good, moral characters as the former." This statement probably sounds far less startling today than it did a hundred years ago, our increased knowledge of heredity notwithstanding.¹ Robert Owen was the prophet of a new moral world founded on universal charity and public ownership to replace the old immoral world founded on superstition (as it seemed to him) and private property. His theories and forecasts have gained impressiveness through the outcome of his agitation for factory legislation, through the ultimate result of his advocacy of an eight-hour working day, through the growth of the coöperative movement which he set on foot, as well as through the far-reaching influence of his demonstration at the New Lanark Mills on the Clyde of how a factory population may be transformed by good treatment and sanitary surroundings, and, particularly, how degraded children may be educated without harshness or coercion.

To Karl Marx (1818–1883), through whose exertions socialism became a great power, the overthrow of capitalism appeared, in the light of his prolonged investigations, as an inevitable step in the advance of industrial civilization. As in the course of economic evolution the old landed aristocracy, which had controlled the chief source of wealth before the advent of modern commerce and industry, was forced to make way for the prosperous merchant and manufacturer, so these in turn must yield to the increasing pressure of the working man. The social force that produces these changes is, according to Marx, as sure in its operation as the force of gravitation. When wealth accumulated through the growth of trade and manufactures, especially at the time of the Industrial Revolution, the dominance of the landed proprietor, the representative of the feudal tradition, was replaced by that of the bourgeois capitalist. But now it is evident that capitalism by

¹ Compare, however, the views expressed by Dr. W. J. Hickson, the Chicago psychopathologist, in his pamphlet *Can Science Detect the Future Criminal in the Child?* 1928.

the very process of its development is doomed to destruction. This is particularly obvious in the changing attitude of the capitalist toward competition. At one time competition was hailed as the great stimulus of business enterprise. In England, for example, when Parliament abolished in 1623 some of the old monopolies, the shackles seemed to be struck from foreign and domestic trade. Competition was considered the giver of new life. It was then in vain that idealists lamented the low ethics of competitive business and that advocates of industrial reform made the wastefulness of competition the target of their criticisms. Now, however, the capitalist has come to see that the elimination of rivals and competitors is the secret of business progress. The smaller capitalists and companies must, in the interests of business development, be absorbed or annihilated. "What the bourgeoisie produces above all," said Marx, "is its own grave-diggers." It is good business policy to combine enterprises of unlike as well as of like kinds. In the natural endeavor to avoid the wastefulness of competition capitalism is thus led to form ever bigger corporations and combinations. All legislation to check this natural tendency is a mere makeshift. To avoid the domination of monopolistic capitalism the state must sooner or later assume direct control of the major means of production and distribution.

In the judgment of Marx the fact that socialism is sure ultimately to triumph, that the domination of the bourgeoisie must give way to that of the proletariat, just as the domination of the feudal lord gave way to that of the bourgeois capitalist, is no reason why those who recognize the inevitableness of social and industrial evolution should relax their efforts. Intelligent leadership is essential in a progressive society. The wage-earners, who suffer most from the evils of the capitalistic system — dependent on the owners of the means of production, compelled to take what they can get, or reduced by the million to a demoralizing idleness — must be guided through political liberty to industrial freedom. Great changes in the past have seldom come about without conflict, and in the future the fierceness of the

struggle must depend on the stubbornness of the opposition to the inevitable. Among the specific demands formulated by Marx, on the eve of insurrections in the most highly civilized countries of Europe in 1848, were the following: free education, a graduated income tax, a national bank, a national transportation system, state factories, the equal liability of all to work, the abolition of property in land, and the abolition of all hereditary claims. The King of Prussia was aghast at the prospect of the establishment of the sovereignty of the people, and the French King abdicated. But throughout Europe the forces of reaction soon regained complete control.

Socialism, according to Dr. Skelton, stands out as the most remarkable international movement in history, commanding the support of millions of voters, who represent every civilized country under the sun. In Germany in 1912 there were more than 4,240,000 voters in the Social Democratic Party,¹ which was represented in the Reichstag by 110 members, notwithstanding the aristocratic subterfuges of the German voting system and the inadequate allotment of seats to the great industrial centers. As we learn from the pages of Prince von Bülow, the imperialistic fear of the influence of the socialists in checking the growth of the army and navy had much to do with precipitating the Great War. The Labor Party in Great Britain is also, of course, predominantly socialistic. In 1900 it had only 62,000 votes; in 1906 it had 323,000; in 1910 it had 500,000; in 1918 it had 2,244,000; in 1922 it had 4,235,000; and in 1924, although defeated by the Conservatives, it had 5,500,000. *The Times* (London), speaking of the attitude of the people as shown by the general election of 1924, declared: "They were invited to reject the whole political and social system they have inherited and developed through hundreds of years as fundamentally mistaken and to substitute in its place machinery for the creation of a socialist commonwealth. They have given their answer, and seldom if ever in our

¹ The recent elections in Germany have shown that the Social Democrats have more than doubled their voting strength since 1912.

long and varied political annals has an answer so decisive been recorded." The Conservatives polled 8,000,000 votes. Other anti-socialist newspapers in Great Britain were, not unnaturally, less exultant than *The Times* over the results of the election, though they were no less deeply impressed by the momentousness of the issue at stake.

Among the many advances which have already been made in civilized countries in the application of socialistic principles, in addition to the experiments in municipal ownership treated in a previous chapter, only a few of the most significant need be mentioned here. Germany, under the direction of Bismarck, who was actuated by the express motive of frustrating the growth of socialism, was the first country to introduce such radical legislation as the enactment of old-age insurance, and the insurance of workmen against sickness and accident. In the years following 1905 the British Parliament, on the initiative of the leaders of the Liberal Party, made provision for the decisive shifting of the burden of taxation from the poor to the well-to-do and wealthy, for the improvement of housing conditions, for the granting of old-age pensions, and for the insurance of workmen against accident and ill health. Similar advances were made in France, Italy, Belgium, the Netherlands, Australia, and other highly civilized countries. Government control of transportation will be briefly dealt with in the following chapter. Finally, New Zealand owns 3,138 miles of railway of the total 3,254 on the islands, controls a large amount of the occupied land, sets limits to the size of private estates, levies progressive income and land taxes, provides old-age pensions, and furnishes life and fire insurance.

REFERENCES — Cole, G. D. H.: *Guild Socialism*, 1921; Hutchinson, R. H.: *The Socialism of New Zealand*, 1916; Lederer, E.: "Communism," *Ency. Brit.*, 13th ed., 1926; MacDonald, J. R.: *Socialism — Critical and Constructive*, 1921; Myers, W. S.: *Socialism and American Ideals*, 1919; Shaw, G. B.: *The Intelligent Woman's Guide to Socialism and Capitalism*, 1927; Skelton, O. D.: *Socialism — A Critical Analysis*, 1911; Snowden, P.: *Socialism and Syndicalism*, 1915; Spargo, J.: *Social Democracy Explained*, 1918; Webb, S. and B.: *A Constitution for the Socialist Commonwealth of Great Britain*, 1920. See also *The New Zealand Official Year-Book*, 1927.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the teaching of Robert Owen has exerted a greater influence on civilization than has that of Karl Marx.
2. What in your judgment are the effects on character of extreme wealth, of extreme poverty, and of unemployment?
3. Write a brief essay on "Christian Socialism," explaining the opinion that competition is essentially immoral.
4. Explain the present uses of the terms "bourgeoisie" and "proletariat," and tell when the terms "socialism" and "socialist" first came into use.
5. Discuss the view that in the struggle between capitalism and socialism the decision must depend on the effect of these systems on the personal liberty of the individual.
6. Explain the statement that all legislation designed to check the formation of trusts and mergers is a makeshift. Express your own judgment in this matter.
7. Is communism a kind of socialism? What is gild socialism? Syndicalism? Anarchism?

XX

THE CLAIMS OF CAPITALISM

“By capitalism,” said Professor Seligman, the distinguished American economist, in a debate held in New York a few years ago, “we may understand that form of industrial organization where the means of production — and by that I mean primarily the machine and the funds required to work the machine — are in the hands of private individuals.” The discussion on this occasion of the general claim that capitalism has more to offer the workers of the United States than has socialism was so ably conducted, in such a courteous and conciliatory spirit, and with such fairness in the use of terms, that its arguments, which are not without permanent value, may profitably be reviewed in detail. Marshaled in support of the special claims of capitalism with consummate skill by one qualified in every way to speak with authority, these arguments are very impressive, and must tax the ingenuity of socialists, as well as of all those who are sympathetic with socialistic aspirations for the moral improvement of society, either to refute or to qualify.

That capitalism is a *progressive* form of industrial society was the first among the special claims to be presented. Here representative socialists, from Marx down, are in substantial accord with the exponents of the claims of capitalism. If capitalism on the whole be compared with feudalism on the whole, the former must be regarded as an advance on the latter. In the organization of large business enterprises and the increase of wealth, the second half of the nineteenth century was, also, superior to the first half. The typical socialist would not undertake to challenge the fact of industrial development, which is, indeed, his gospel. He is, in the

words of a leading British socialist, an evolutionist *par excellence*. Freely admitting, then, the claim that modern capitalism is progressive, he must rest content with asking in what direction it is advancing. History informs us as to the *terminus a quo*. What is the *terminus ad quem*?

Among the past achievements of capitalism stand, of course, the accumulation of wealth and the cheapening of production. For example, the claim reads, the railways of the United States, with their twenty billions of capital, would have been impossible in any previous state of society. They render an indispensable service to the laborer in getting him to and from his work every day. Professor Seligman might better, perhaps, have referred to the history of banking, though that would have involved the dangerous question of the People's Banks and the development of coöperative credit. At any rate, the illustration he did choose was particularly unfortunate, for we learn from an article ¹ written by him in 1919 that the government railways in Prussia had for a considerable time yielded a large annual surplus, which had helped to lighten the burden of taxation, and that, as he believed, if the railways were taken over and permanently operated by government in the United States, the public would get the benefit not in reduced taxes but in lower railway rates. On the same authority it appears that the railways of all industrial states have passed through, or are passing through, certain similar and well-defined stages of development. Here, as in other large business enterprises, the economist maintains, competition inevitably gives place to combination. "There is obviously no logical halting point," he continues, "in the evolution from primitive competition to ultimate monopoly in the railway business." It was, moreover, his opinion that the actual government operation of railways in the United States, though undertaken in an emergency and in exceptionally trying circumstances, had furnished proof of the wastefulness of private competitive ownership, of the relief afforded to

¹ "Government Ownership or Government Control of Railroads," 2d ed. From the *Journal of the National Institute of Social Sciences*, June, 1919.

railway congestion by joint terminals and joint ticket offices, of the advantages of the abolition of indirect routing, and of the general good results of unified management. He believed that there was no reason why railway ownership in the course of its evolution should not eventually reach the same objective in the United States as it had reached, or was about to reach, in Germany, Switzerland, Italy, France, Japan, New Zealand, Australia, and other highly civilized countries.

It is true that even a restrained statement of the inroads made in the world's natural resources during the last few decades is alarming — the destruction of the forests and the consequent drying up of the streams, the impoverishment of the soil, and the wasteful consumption of natural gas, petroleum, coal, copper, and other minerals. "There is no doubt," said the late President James, speaking of the United States, "that we have in many directions wasted our patrimony. In our haste to get rich we have overreached ourselves and undermined the very basis on which a permanent national industry and a permanent national life should rest." Though we may not accept the opinion of investigators who contend that capitalistic trade rivalry was the fundamental cause of the Great War with its catastrophic destruction of property and reckless expenditure of wealth, yet capitalism must bear a very considerable share of responsibility for the improvident exploitation of resources. Nevertheless, let us acknowledge freely the validity of the claim that capitalism has contributed to human progress through the accumulation of wealth and the cheapening of production, as well as through the world-wide distribution of commodities and the emancipation of the laborer from the last traces of feudal serfdom.

In the next place the claim is advanced that capitalism is responsible for democracy, for education, and for science. Here there is something to accept and much to reject. "What has brought about democracy," it is maintained, "is the Industrial Revolution or modern capitalism and that means a public opinion which has never existed before in the history of the world." The Industrial

Revolution, as we have already seen, did further the growth of cities and the growth of democracy. Moreover, it is a continuing process, its influence is not spent, and the democracy of the twentieth century is quite different from the democracy of the close of the eighteenth century. A brief statement of events in the history of British legislation will indicate with what hesitation, and under what auspices, the spirit of democracy advanced. The Combination Acts of 1799 and 1800 were not directed against capitalistic trusts and cartels. On the contrary, they forbade, in the interests of employers, all common action among employees in the defense of their rights. The working day was extremely long, and ten shillings a week was considered outrageously high pay for a workman. By the Reform Acts of 1832 the suffrage in towns and cities was granted only to citizens who occupied houses of an annual rental of ten pounds or more. That this democratic or, rather, liberal measure was drawn up not in the interests of the very poor is further shown by the fact that the Chartist petition — for universal suffrage, secret balloting, equal electoral districts, the abolition of property qualifications for members of Parliament, the payment of members, and annual elections — was denied by a large majority of the reformed House of Commons in 1839. Every step in the progress of democracy was gained in face of the stubborn opposition of the manufacturers, the landed proprietors, and other privileged classes. If it be true that capitalism fathered a well-informed public opinion at the close of the eighteenth century, did it not soon develop a tendency to look askance at its own offspring? At least it has frequently been charged with distrust of free speech and free assembly, with endeavors to control the newspapers and various other possible sources of anti-capitalistic propaganda. On the other hand, it is rather the socialists who proclaim that the deliberate intensification of the searchlight of public knowledge is the prime requisite of successful democracy.

Students of history will find some difficulty in understanding, and still more in supporting, the claim that modern capitalism is responsible for education and for science. "Never before in the

history of the world," we are told, "have we had a form of public instruction comparable to our own. Weak though it be, defective though it be, the amounts of money that are spent today in every capitalistic society for the public schools, for education that goes down into the kindergarten and up into the state university is something that the world before has never known." Disregarding the emphasis on the amounts of money involved, overlooking the revolutionary and popular auspices under which the kindergarten and the American state universities were fostered, and candidly acknowledging that the eulogy of education in the United States is fully deserved, we think unwarranted the capitalistic claim to its inception at least. It is significant that in Great Britain, where modern industrial capitalism first gained supremacy, public education was very slow to develop, while in Massachusetts (and many other parts of America) where capitalism rose much more slowly to power, education was early recognized as a responsibility of the commonwealth. The early progress of education in the United States was owing, in a very large part, to the religious and democratic spirit which made its influence tell in America more than a hundred years before the beginning of the Industrial Revolution, from which the advocate of the claims of capitalism dates its rise. In his judgment science, described as the unlocking of the secrets of nature, is also a distinctly modern product. "It began only with the introduction of modern capitalism. And you see why that is — because the modern business man in order to succeed must know the secrets of nature." This is, of course, a bit of special pleading, although, as we have seen in the case of Pasteur and others, modern industry has greatly stimulated scientific research. The history of science cannot overlook the labors of Aristotle, Archimedes, Copernicus, Vesalius, Gilbert, Harvey, Kepler, Descartes, Galileo, and Newton, who lived and died before the time of the Industrial Revolution.

The capitalist does not deny that there are certain dark spots in the industrial organization of the present day, such as unfair competition, monopolies, unjust privileges, exaggerated fortunes, and

an undue development of the leisure class. He contends that these weaknesses and excrescences of capitalism are being made good. It seems that the old-time unscrupulous capitalist has finally been put to flight by democratic public opinion, now grown so sturdy as to hold its progenitors in awe. Unscrupulous railway corporations are brought under control by the Interstate Commerce Commission. Society under capitalism (or, let us say, capitalism under society) is gradually rendering competition more and more fair. The forces of government are doing away with many forms of privilege and endeavoring to check monopoly. Progressive taxation is an example of the means taken by capitalism, so the claim runs, to restrict some of its own evils. In fact, we might add, capitalism is itself showing a socialistic tendency under pressure of the ethical ideals of the democracy. It is indeed a progressive form of industrial organization.

When attention is shifted from the capitalist to the laborer, great evils, as the spokesman of capitalism freely admits, are discovered — long hours, inadequate wages (“certainly far less than they should be”), insecurity of employment, and joylessness of life. Some of these conditions are being improved. The working day has been reduced to twelve, ten, and eight hours, and some of the factory laws permit only six hours in certain industries. “Capitalism is gradually changing these conditions (hearty laughter) — capitalism is changing these conditions not because it likes to do it, but because it is compelled to do it by the letting loose of those very forces which are implicit in modern forms of capitalism.” Here the generous and enlightened economist adopts the socialistic conception that the capitalistic organization of industry bears within it the seeds of its own ultimate destruction. He sees no reason, he proceeds, why workmen should have to bear the burden of unemployment and insecurity of tenure. But, socialists ask, how is the capitalist to maintain his position in a crisis, if the state by a system of unemployment insurance, or by the annual distribution of hundreds of millions of dollars to millions of families (as in Great Britain since 1921), upsets the principle

of supply and demand in the labor market? What is no less important as regards the welfare of society in general, how are the wage-earners to be saved from demoralization under a system of doles and pensions, soup-kitchens and free movies, the modern equivalent of the *panem et circenses* of the Roman Empire in its decline? However, we agree with the advocate of capitalism that the defects of industry must be remedied by industry itself with the aid of the central authority of the state. Even the joylessness of factory life, which he regards as inevitable, may be to some extent alleviated, like the drudgery of school work, by a greater measure of freedom and responsibility. Into the automaton of the factory, as of the classroom, must be breathed some portion of the creative spirit.

The exponent of the claims of capitalism is impelled to admit as desirable: progress from the private ownership of railways to their public ownership, from competition to combination, from unregulated to regulated monopoly, from arbitrary control to scientific control, from the rule of individual to that of public opinion, from oligarchy to democracy, from serfdom to freedom, from wastefulness to economy, from privilege to impartial justice, from exaggerated fortunes to moderate fortunes, from class diligence to universal diligence, from long hours to short hours, from a living wage to a much higher wage, from personal responsibility for work and maintenance to state responsibility for maintenance and work. In spite of all this he feels unable to accept with equanimity the prospect of industrial democracy, because it would deprive the individual of incentive, enterprise, self-expression, and the desire of distinction, mastery, leadership — in fine, of his personal liberty.

Capitalistic civilization would have been open to like objections in the eyes of the primitive hunter and the medieval baron. The successes of the steel mill and the bank would have appeared to them lacking in motive and the spirit of high enterprise. The pursuit of gain would have seemed to them a poor substitute for the boar hunt or the man hunt, and they would have turned in disgust from the vision of our busy manufacturing cities. The advance of

civilization implies a transformation of ideas concerning personal satisfactions and corporate responsibilities. Those who laud the fine effects on society of the motive of impending need, as President Eliot termed it, take great pains not to expose their own children to its stimulating influence. The millionaire who prides himself on being a self-made man hedges his offspring about with riches in order that they may live by owning and not by doing. We need not dwell on the fact that our industrial system suppresses the individuality of the worker, and that now, as in the days of the poet Gray, penury checks the growth of personality. Contemporary literature, the investigations of our social psychologists, the recorded observations of the members of the inventors' gild, furnish sufficient evidence of the influence of modern industrialism in mechanizing intelligence and discouraging originality. William Morris joined forces with the socialists because he was convinced that the industrial conditions of his time were detrimental to the growth of the spirit of artistic creation. Many serious thinkers agree today that not only the artist and the artizan, but the clergyman, the teacher, the journalist, the engineer, and the representatives of all the vocations, are liable to be enmeshed in the same coil; for, as Ramsay MacDonald says, those who control the means of life control men. It is because the present type of civilization belittles the human mind and hampers the development of human character that spiritual leaders such as the Archbishop of York ¹ seek to restore the faith of the people in an ever-advancing social progress.

REFERENCES — Benn, E. J. (Sir): *Confessions of a Capitalist*, 1925; Belloc, H.: *The Free Press*, 1918; Dell, R.: *Socialism and Personal Liberty*, 1921; Dobb, M. H.: *Capitalist Enterprise and Social Progress*, 1925; Garvin, J. L.: "Capitalism," *Ency. Brit.*, 13th ed., 1926; Seligman, E. R. A. and Nearing, S.: *A Public Debate — Capitalism vs. Socialism*, 1921; Webb, S. and B.: *The Decay of Capitalist Civilization*, 1923; Withers, H.: *The Case for Capitalism*, 1920. See also the *Report on the Steel Strike of 1919*, by the Commission of Inquiry, The Interchurch Movement, 1920; and the report of an address by the Archbishop of York at the Church Congress, *The Times* (London), October 11, 1922, p. 12.

¹ The Most Reverend Cosmo Gordon Lang, now chosen to succeed to the Archbishopric of Canterbury.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That capitalism has more to offer the workers of the United States than has socialism.
2. Sketch the early history of banking, giving special emphasis to the Bank of Barcelona and the Bank of Amsterdam. Is it strictly true that modern capitalism was the consequence of the Industrial Revolution?
3. Write an essay of three or four thousand words on "The People's Banks," giving an account of their development. (Among many interesting books on this subject I can recommend with particular confidence the work of H. M. Wolff, *People's Banks: A Record of Social and Economic Success*, 4th ed., 1919.)
4. Describe the Combination Acts of 1799 and 1800. At whose instigation were they passed by the British Parliament? What effect were they designed to have on the free expression of public opinion?
5. Give an account of early legislation to encourage the establishment of schools in Massachusetts, and compare with this action of the colonists the action of the British legislators. (J. R. Green in his *A Short History of the English People* speaks of a system of national education begun in 1834 by a small annual grant toward the erection of schools.)
6. Discuss the view that it was the development of the physical sciences that gave rise to modern capitalism.

XXI

NATIONALISM AND INTERNATIONALISM

An Austrian writer, impressed by the difficulty of importing the ethical spirit into foreign as into domestic politics, suggests that it might be better if men had less of one virtue, namely, patriotism. Let us approach the discussion of this paradox deliberately and dispassionately.

The nation, a comparatively recent phenomenon, was developed by slow degrees from the tribe or brotherhood, or from a still earlier form of social organization. In the investigation of the origins of European civilization Hartwell Jones is not alone in assuming that the family was the germ out of which all social and political life grew. Among the Romans, as well as among other civilized peoples of antiquity, the family, as he observes, in spite of polygamous practices, became early invested with a special sanctity. The hearth, about which were gathered the most precious household possessions, was not only the center of friendly and familiar intercourse, but was also the family altar, whose sacred flame was associated with the remembrance of departed ancestors and the recognition of parental authority. The power of the *paterfamilias* was almost absolute. He was at once guardian, priest, and judge. But the clan or gens, whose claim to rank as the primary social unit is sometimes placed in opposition to that of the family proper, had traits similar to those of the groups of which it was composed — a common ancestry, a communal property system, a communal hearth, and a religious ceremonial. The clansmen chose a leader whose functions were similar to those of the *paterfamilias*. The organization of the brotherhood and the tribe for military, judicial, and religious purposes resembled that of the clan. With

the growth of the community the blood relationship of its members became less significant than their political solidarity, and the idea of territorial unity superseded that of kinship. There is also much that is typical of the social and political evolution of mankind in the special traditions and early history of the agricultural tribes of Latium — their custom of repairing once a year to the Alban Mount to join in homage to their chief god, their acknowledgment of the leadership of Alba Longa when forced to unite for mutual protection, the subsequent supremacy of the tribes of the Palatine and of the surrounding hills on the left bank of the Tiber (who were able to offer their allies opportunities for trade and commerce and contact with alien peoples), and, finally, their organization under the city-state.

The famous early city-states, which certainly did not lack a semblance of national consciousness, soon, like Athens, fell a prey to foreign conquerors, or, like Rome, became themselves the centers of extensive empires. These aggregations of peoples, which owed their existence to the triumph of a single city-state over its rivals, were wanting, according to Professor H. E. Barnes and others, in the homogeneity of culture and the diffusion of patriotic sentiment essential to the modern conception of nationality. He indeed indicates in rather caustic terms the likeness of the Roman Empire to one of the most nationalistic of our recent states, in the crude expression of its collective egoism, in the public theory that all its wars were defensive, in its surplus-population argument for expansion, in the control of its diplomatic and military policy by the landed aristocracy, in its sinister methods of statecraft, in its callous disregard of treaty obligations and the rights of lesser peoples, and in its harsh and brutal treatment of conquered populations. Nevertheless, the influence exerted by the Roman Empire through the Stoic doctrine of the brotherhood of man, through the use by the races under its sway of the Latin language and literature, and through its system of well-formulated laws, was cosmopolitan rather than national, and checked the growth of the spirit of local patriotism which the city-states had fostered. Rome was for

centuries not merely the political but the ecclesiastical and spiritual capital of the civilized world. When the authority of the Papacy came to support or to replace that of the Empire, the conception of a Christian commonwealth embracing all peoples began to gain acceptance. The Pope became the arbiter of Christendom. By his fiat he undertook to free subjects from their allegiance to an unjust ruler and to rebuke the disobedience of all earthly potentates. Even on the eve of the Reformation his voice was still decisive in the settlement of international disputes. Thus we see that socialism, though it is regarded by many as the most important international movement in history, is by no means the first attempt to substitute peace and coöperation for the insensate cruelties of war, to supplant tribalism by universal humanism, to introduce ethical motives into the mutual relations of peoples and nations, and to promote the moral unity of civilization.

The enterprise of Italian and Hanseatic merchants, the growth of industry, the prosperity and increased numbers of the middle classes in the medieval city-states, the collapse of the feudal system, and the rise of a vernacular literature in Italy, France, and England, contributed to that decisive development of the spirit of modern nationalism which occurred in western Europe in the fourteenth, fifteenth, and sixteenth centuries. In 1315 by the victory of Morgarten over Leopold of Austria the Swiss had secured their independence. In the previous year the Scots under Robert Bruce had by the battle of Bannockburn thrown off the English yoke. The competition between the seamen of Normandy and the Cinque Ports, which the royal authority was powerless to restrain, precipitated the Hundred Years' War, in the course of which struggle the national sentiment of both contestants was crystallized. "As to the peace with the English," exclaimed Jeanne d'Arc, the herald of modern French patriotism, "the only possible one is that they should go back to their own country in England." In the sixteenth century the decline of the English nobility (already weakened by the Wars of the Roses), the concentration of power in the hands of the Tudor monarchs, the increasing prosperity of

the kingdom, the collision of the English with other peoples in commerce and in war, and the revolt against the Holy See, raised patriotic sentiment to the highest pitch. The development of Portuguese and Spanish patriotism in the age of the great discoveries, the growth of the power of Spain under Charles V and Philip II, the rise of the Dutch Republic under William of Orange, and the partial unification of France under Henry of Navarre, stand out as landmarks in the progress of nationalism.

Hardly, however, had the principle of autonomy and sovereignty in these European nations gained recognition, when the need was felt of reasserting the complementary principle of the essential solidarity of civilization. We have already observed the progress at this time of the study of international law. The plans for a united Christendom put forward during the Thirty Years' War by Sully, the project of perpetual peace advanced by the Abbé de St. Pierre at the close of the War of the Spanish Succession, and the commentaries on this project by Rousseau and Kant, formed the intellectual background of Alexander I of Russia's proposal for a League of Peace at the time of the Napoleonic wars. In 1805 Alexander expressed to William Pitt the hope of bringing about a permanent peace by an international congress in which all the peoples of Europe would undertake not to engage in war until all the resources of mediation had been exhausted. After the final defeat of Napoleon ten years later, Alexander invited his fellow monarchs to join him in an alliance and to adopt for their guidance in international politics the precepts of justice, charity, and peace. Modern nationalism and modern democracy had not, however, at that time sufficiently developed to make Alexander's plan feasible. The Holy Alliance, as the League of Peace was popularly called, soon became, in the hands of the reactionary statesman Metternich, a means of checking all liberal and national aspirations.

In a conversation with Las Cases at St. Helena in the autumn of 1816 Napoleon expressed his views concerning the relation of nationalism to internationalism. During the Consulate his adherents had frequently asked him *what point he was driving at*. He

told them he did not know. He felt like a helmsman in a storm whose attention is fully occupied keeping his ship off the rocks. When he was emperor, he had read the same question in the eyes of many people, but was still unable to formulate a definite answer. He did not feel that he could impose an ideal system on the political world. One of his great plans, he averred, was to form the principal peoples of Europe into compact, distinct, independent nations with definite geographical boundaries. His plan was fully elaborated in the case of the Italians. He intended all the states of the peninsula to be incorporated ultimately in a free and homogeneous realm. The consolidation of Germany must, on account of the great number of states, duchies, and so forth, be effected more gradually. No German prince had in 1816 arrived at a just appreciation of the national spirit of the German people. After there had been established in every European country a certain unity of opinions, interests, laws, and principles, one might hope to attain the *beau ideal* of civilization, uniting the various nations of the continent in a confederation, comparable to the American Union or to one of the ancient Greek *amphictyonies*. Thus, in Napoleon's judgment, internationalism must wait on nationalism. He foretold that the concentration or consolidation of Italy and Germany was sure to be effected sooner or later by the force of circumstances, and he maintained that only through the confederation of the principal nations could a condition of real stability be brought about in Europe. "The sovereign, who, in the first great conflict, shall sincerely embrace the cause of the people, will find himself at the head of all Europe, and may undertake whatever he pleases." In spite of its obvious limitations this plan, for the consolidation of each of the peoples of Europe into a compact nation and for the eventual union of the principal nations in a supernational organization, is of interest as presenting the political ideal, if not revealing the actual policy, of a great practical statesman.

Nationality is largely dependent on cultural affinities. Purity of race, or ethnic homogeneity, is not essential to it. As already indicated in an earlier chapter, no nation of Europe can claim to be

of pure Iberian, Alpine, or Nordic stock. The people of South Germany are more closely related racially to the people of the contiguous parts of France than they are to the people of West and East Prussia. We cannot, without running the risk of confusing our political conceptions, speak of the civilization of the United States as an Anglo-Saxon civilization, nor can we describe the British as an Anglo-Saxon nation. As Napoleon recognized, nations, historically considered, are not identical with states. The German nation of his time was divided into numerous governmental groups, while the Austrian state comprised within its boundaries peoples of various nations. Nationality may exist without geographic unity, and the latter does not always entail a sense of political interdependence among the inhabitants, as Metternich pointed out with reference to the Italians in the early part of the nineteenth century. Identity of economic interests and a common language must, likewise, be regarded as important conditions rather than as invariable antecedents of the development of the patriotic spirit. No less potent as national ties than race, geographical unity, common economic interests, religion, and language, are the desire for mutual protection, joint participation in great enterprises, common laws, traditions, legends, songs, records and memories of common triumphs and defeats, suffering and wrong.

From the international point of view a serious menace to political progress lurks in the type of devotion to one's country, right or wrong, of which Stephen Decatur was the spokesman. An exaggerated patriotism is comparable with an undue devotion to clan or family. It has been described by more than one writer as a sort of egoism. Nothing, as Sir Auckland Geddes declares, can save the peace of the world if this nationalistic ego complex is created in an overwhelming number of young minds. It is notorious that the study of history, which should be a means of imparting political wisdom and international good-will, is frequently perverted into an instrument of nationalistic propaganda. In some of our textbooks the brilliant colored plates of martial scenes, the choice of

material, the very ring of the words and sentences, seem expressly designed to glorify war and to incite an arrogant and belligerent spirit. In the works of men of genius, even of the foremost nations, there may be observed at times a neglect of all phases of history that are universal in their appeal, accompanied by a vitiation of literary style which leaves no room for burlesque. We read, for example, that Henry VIII, on ascending the throne, was a most splendid young man. He was naturally cruel; he sliced off the heads of his relatives. He was a monster of cruelty and selfishness. But, our historian proceeds, he was also something more. He was a great patriot, a great Englishman. His daughter Mary was really a Spaniard and, therefore, vindictive. Elizabeth's reign was on the whole mainly occupied with two long duels — with Mary Queen of Scots and Philip II. The early Stuart kings built splendid ships but did not make use of them, while the sailors were itching to cut popish, Spanish, and Portuguese throats.

From this sort of patriotism we turn gladly to the teachings of Mazzini, the chosen apostle of nineteenth century nationalism, who, loving Italy above all earthly things, never for a moment lost sight of the paramount duty of all nations toward humanity in general. His, as Lord Morley said, was the moral genius that spiritualizes politics, his the gospel of progress through state control of production and consumption, democracy, and universal education. "I lift myself to the vision of the future," cried this great Italian patriot, "and behold the people rising in its majesty, brothers in one faith, one bond of equality and love, one ideal of citizen virtue that ever grows in beauty and might; the people of the future, unspoilt by luxury, ungoaded by wretchedness, awed by the consciousness of its rights and duties." Before associating itself with the nations that compose humanity a people must, according to Mazzini, exist as a nation. Without nationality it cannot be admitted on equal terms into the fellowship of peoples. Country and family are like circles drawn within a greater circle. We have a country in order that within a limited field we may labor for the benefit of all men. Our country is the fulcrum of the

lever which we have to wield for the common good. In imagination Mazzini saw a united republican Italy, an Italy of the people, far greater than the Italy of the emperors or the popes, and representing a religion of progress and fraternity. He foretold a supreme conflict with absolutism, the final result of which would be a new map of Europe. He dreamed of a confederacy of peoples, a brotherhood of nations, coincident with the civilized world.

In the first quarter of the nineteenth century the Spanish colonies on the American continent had given rise to a number of autonomous republics. In 1829 the Greeks had gained independence, and in 1831, the Belgians. In the decade following the unification of Italy and Germany, three of the Balkan states were freed from the Turkish yoke. Brazil became a republic in 1889, Norway separated from Sweden in 1905, Bulgaria gained complete independence in 1908, and Portugal drove Manuel II from the throne in 1910. In Europe since 1914 the readjustment of boundaries, the setting up of numerous new states, and the general adoption by them of the republican form of government, betoken the further triumph of nationalistic and democratic principles. Even Germany, Austria, and Turkey have turned republican. The governments of Spain, Italy, and Hungary have undergone modifications of which no monarchist can boast. Will the League of Nations, which represents four-fifths of the population of the world, prove eventually to be such a confederacy of democratic states as Mazzini prophesied? Even the most optimistic will concede that radical changes must occur before this ideal is attained, but in the meantime there can be little doubt as to the trend of political development, either national or international.

REFERENCES — Addams, J.: *Peace and Bread in Time of War*, 1922; Barnes, H. E.: "Nationalism," *Ency. Am.*, 1925; Butler, N. M.: *The International Mind*, 1913; Geddes, A. (Sir): "Internationalism — A Hope for the Future," *Annals of the Am. Acad. of Pol. and Soc. Science*, July, 1923; Hill, D. J.: *The Rebuilding of Europe*, 1917; Hobson, J. A.: *Toward International Government*, 1915; Krehbiel, E. B.: *Nationalism, War and Society*, 1916; Mazzini, J.: *The Duties of Man* (English translation, 1862); Muir, R.: *Nationalism and Internationalism*, 1916; Rose, J. H.: *Nationality in Modern History*, 1916.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That it is the duty of a patriotic historian to record with absolute impartiality the past of the nation to which he belongs.
2. Review any history written from a frankly nationalistic point of view (such as *A History of England* by R. Kipling and C. R. L. Fletcher), stating your opinion of its probable effect on the mind of an immature reader.
3. Discuss the view that patriotism is consistent with the highest culture.
4. Describe the state of the national consciousness of the English people in the time of Queen Elizabeth. What were its causes?
5. Explain the statement that nationalism is largely dependent on cultural affinities.
6. Criticize Napoleon's conception of a union of the principal nations of Europe in a supernational organization, and compare his political ideals with those of Mazzini.
7. State in a brief essay your views concerning the present trend of politics, national and international.

XXII

MUTUAL AID

Before bidding farewell to the problems of contemporary politics we must try to appreciate the attitude of those political and social reformers who repudiate patriotism altogether and predict the collapse of nationalism as a hindrance to the progress of mankind. True progress, they say, lies in the direction of decentralization. The existence of the state and the existence of slavery are inseparable. The modern state is merely an instrument employed by the bourgeoisie to keep the exploited classes in subjection. The era of revolutions is not yet closed, and sooner or later the functions of the state must be taken over by voluntary coöperative associations. The ideal of the most radical critics of contemporary civilization is to live without government and without law. They assert that man can reach the highest point of his development only through spontaneous association with others, unhampered by tyranny and tradition. They find in each person a tendency toward individualization and a tendency toward socialization, and maintain that society would develop an organization fitted to its actual needs if only it were once freed from governmental dictation. They fail to see in our present governments the products of voluntary association.¹ According to Tolstoy and other anarchistic communists the state must be regarded as the domination of the evil ones supported by brute force. Whenever the state calls its citizens to arms, each individual should meet the call by an attitude of passive resistance. In his *War and Peace* Tolstoy attempts to show that the failure of Napoleon's Moscow campaign was owing to the combined efforts of the Russian common soldiers, and that Marshal Kutusov's great virtue as a commander was a mystic faith in their initiative. The author's arguments are far from convincing.

¹ Compare Garner, J. W.: *Political Science and Government*, 1928, pp. 63-64.

The medieval gild is one of the clearest examples in history of those associations for mutual aid which have arisen without the intervention of rulers and legislative bodies of any sort whatever. The gilds were the outcome of a natural social impulse. They arose so spontaneously that no historian has yet succeeded in discovering their origin or tracing the course of their early development. They existed in the cities of Lombardy in the eighth century, in England in the ninth, and in France, the Netherlands, Germany, and Norway before the close of the twelfth. Their purpose went far beyond the purely economic. They were pervaded by a religious and fraternal spirit. The members contributed to a common purse which might be drawn upon in the interests of business, pleasure, or charity. One of the recognized aims was to make provision against sickness, old age, destitution, losses by fire, robbery, and shipwreck. In Flanders and elsewhere, as we have seen, the gilds contributed to the growth of democracy. They regulated the hours of work and other trade conditions. Each gild saw to it that all the members should have a fair share of employment, and that none should establish a monopoly by engaging a very large number of helpers. The restriction by gild regulation of the number of apprentices contributed to the development of a method of vocational training that has never been surpassed. After the apprentice, under the supervision of a master, had applied himself to the acquisition of his craft for from three to eleven years (according to its difficulty), he became a journeyman. The journeyman, moreover, had to give special evidence of his skill before gaining admittance to a master's gild. Thus the callings were guarded from incompetents, and a standard of good and honest work was maintained. Under the gild system the producer sold, as a rule, directly to the consumer; while, not infrequently, he was able through coöperation to secure his supplies at wholesale rates. In the fifteenth, sixteenth, and seventeenth centuries the gilds gave further evidence of vitality by amalgamating in larger and larger combinations for the assertion of their economic and political rights. But even in the early stages of their development

they had served as models for voluntary associations differing from them more or less in purpose.

The medieval universities, for example, were modeled after the medieval craft guilds, adopting their methods of organization, terms, titles, and so forth. This was quite natural, since the predominant aim of the early European institutions of higher learning was to provide professional training. Salerno, sometimes described as the first modern university in Europe, was a school of medicine. The study of Roman Law, which had been greatly stimulated by the growth of the Italian communes, furnished the chief motive for the establishment of the University of Bologna, the oldest of the European universities in existence today. Its charter, granted by Frederick Barbarossa, dates from 1158, and its early organization was, in accordance with the political character of the time and place, extremely liberal in spirit. Guilds of merchants living in foreign cities, clubbing together for mutual protection and forming national groups under their proctors, afforded an immediate model for student and faculty organizations. The school at Bologna was a *universitas* — union, corporation, or guild — of students attracted from various parts of Europe by the erudition of the Italian jurists and commentators. The student body elected the rector, or president, and was in absolute control of the institution, determining the course of study and the length of the vacations, and electing, disciplining, and dismissing the professors. Moreover, the students — like the trade guilds in foreign cities — were organized in special unions corresponding to their geographical origin. These academic groups — the so-called *nations* — were the prototypes of our college fraternities, of the dueling corps of the German universities, and of similar voluntary associations. In contrast with the University of Bologna, the University of Paris, established by charter about 1210, was not democratic but oligarchic in its organization. It was a university of masters, that is, a union or guild of those who had taken the master's degree, which was really a teaching certificate, identical with the doctorate or the professorship.

The Hansa (band, union, gild), or league of towns and cities of northern Europe, affords us a particularly striking example of the influence on the development of civilization of voluntary mutual aid associations. It rose to power about the middle of the thirteenth century when the German kings or emperors exercised little authority in their nominal dominions, which became broken up into principalities, duchies, bishoprics, and free cities. In this period of decentralization and anarchy, the spirit of freedom seemed to stimulate to an extraordinary degree the growth of literature, music, architecture, and trade. The league had originated in the gilds of German merchants living abroad, and in the alliances of towns and cities along the North Sea and the Baltic from Middelburg to Revel as well as of the towns and cities of the hinterland from Cologne on the Rhine to Breslau and Cracow. The Hanseatic cities maintained important trading posts at Bruges, London, Bergen in Norway, Novgorod in Russia, and at Wisby on the island of Gothland already mentioned in the chapter on international law. The Hansa had no definite form of constitution; it was a loose confederacy of seventy, eighty, and, at times, more than ninety towns and cities, united under the leadership of Lübeck, Hamburg, and Bremen to protect the trade routes of northern Europe from pirates and robbers, to withstand the aggression of neighboring kings and princes, and to gain the rights and immunities necessary for the prosecution of foreign trade. Occasionally the league took a hand in international politics, as, for example, in declaring war on Denmark in 1367, in supporting the claim of Albert of Mecklenburg to the throne of Sweden, and in obtaining favorable terms of peace from Denmark and from Denmark's ally Norway in 1371. There followed a period of great prosperity for the Hanseatic towns and cities. They controlled the North Sea and the Baltic, and had a monopoly of the commerce of northern Europe, east and west. Their political influence was directed almost solely to the maintenance of their mercantile interests. In the sixteenth century, however, the power of the Hansa declined; its trade rivals disputed its ascendancy in the waters of

northern Europe; the development of new trade routes robbed it of its prestige; and in the reign of Elizabeth it lost its privileges in the English ports. Finally, the Thirty Years' War proved fatal to its hopes of renewed prosperity.

The history of trade unionism serves to show that associations spontaneously organized for the mutual protection and support of men engaged in the industries may become of supreme political importance. The modern trade unions are no less democratic in spirit than the medieval craft guilds to which they bear at least a superficial resemblance. In Great Britain from 1799 till 1824 all trade societies, or benefit clubs, as they were frequently called, were suppressed by drastic laws and their members treated as dangerous revolutionaries. The plan of a general union of producers, for the assertion and maintenance of their economic and political rights, was first put forward in 1818. Even to the liberal statesmen of that and a much later period the design of concentrating power in the hands of the workers appeared as the upshot of a criminal conspiracy of the lower classes endeavoring to rise above their natural station. We have seen how the trade unions contributed to the gradual extension of the franchise, lent support to the program of the Chartists, and continued to gain in political power. In moments of political reaction they sought to redress the grievances of the workers by appeal to the courts, by recourse to mediation, and by other conciliatory measures. In Parliament trade unionism found friends and spokesmen, who upheld it on account of its salutary influence on the character of the manual worker. Its aims were not wholly selfish and material. The British trade unions showed interest from time to time in political progress beyond their own national borders, as in the establishment of Italian independence and in the abolition of slavery in the United States. The international tendency of trade unionism at the present time is in need of no special emphasis.

Since the middle of the nineteenth century voluntary coöperative associations of consumers as well as of producers have been

organized in all the most highly civilized countries of the world. One phase of this movement, full of promise for the reconstruction of society in general, had a very humble origin. In 1843 a few destitute weavers in the mill town of Rochdale, near Manchester, had begun to hold meetings to consider how they might improve the conditions in which they and their families were living. They were particularly concerned for the moral welfare of the community. Temperance and universal suffrage were discussed, but some Owenites who belonged to the group suggested the plan that finally prevailed. After months of saving and recruiting, the Rochdale Society of Equitable Pioneers was founded in 1844, each of the twenty-eight members contributing one pound to start a co-operative store to supply flour, oatmeal, butter, and sugar. Market prices were maintained on principle, the society wishing not to enter into rivalry with the local shopkeepers. Partly to prevent the members from running into debt all transactions were on a strict cash basis. Each member drew dividends in proportion to the amount of his purchases. Wholesome food in full weight and measure was supplied. All the members had an equal voice in the control of the business, and women were admitted to membership on the same democratic footing as men. A definite percentage of the joint annual savings was set apart for education. The society looked forward to establishing an industrial community, free from crime, in which the spirit of coöperation would replace the spirit of competition, and it planned to supplement coöperative buying and distribution by coöperative production. Tea, tobacco, meat, and other items were gradually added to the list of commodities furnished by the coöperative store. Shoemaking and tailoring were successfully undertaken in 1852. During the subsequent forty-two years the membership of this pioneer society increased from six hundred to twelve thousand, while its capital increased from \$13,000 to \$2,000,000.

The results of the Rochdale coöperative movement, in the United Kingdom and throughout the civilized world, have been so far-reaching and so significant for the cause of social and

political progress as hardly to admit of summary statement. In less than eight years after the coming together of the small group of poverty-stricken weavers there had sprung up more than a hundred and fifty coöperative societies in the North of England and in the Lowlands of Scotland. In 1863 a number of these retail societies combined to establish a Coöperative Wholesale Society with headquarters at Manchester. The Scottish Wholesale Society was organized in 1868 and the Irish Agricultural Wholesale Society in 1894. The English C. W. S. soon became famous for its world-wide commercial and industrial enterprises, its manufacture of textiles and clothing, boots and shoes, furniture and hardware, its soap factories and flour mills, its trade in cattle, fish, butter, and cheese, its importation of grain, tea, dried fruits, sugar, tobacco, palm kernels, timber, and other raw materials, its acquisition of coal mines and general farm lands in England, of wheat fields in Canada, of tea plantations in India and Ceylon, and of oil-palm groves in West Africa, its transportation system, its fire, life, accident, and employers' liability insurance, and its banking department, which now boasts an annual turnover of two and a half billion dollars and which carries the accounts of more than fifteen thousand mutual aid associations. The Coöperative Union of Great Britain and Ireland comprises the three great wholesale societies, 1,134 distributive and 105 productive societies, and other coöperative organizations. There is a total enrolment of more than five million members, representing approximately one-third of the families of the British Isles. Lord Rosebery and others have spoken of this great voluntary association as constituting a state within the state. During the past decade it has felt impelled to adopt political measures and to form alliances in order to safeguard its extensive economic interests. In the Proceedings of the Coöperative Congresses and other official publications there are further indications of a growing consciousness of such general aims and ideals as the autonomy of business and the democratic control of industry in the broadest sense of the term.

Since the beginning of the twentieth century the coöperative movement has made rapid advances among the most highly civilized peoples of the world. Its progress has been particularly notable in all European countries, unless we except Albania and Turkey. It has also found its way into the French colonies in North Africa, into India, Canada, and the other self-governing British dominions, into the United States, Argentina, Japan, and China. In spite of those who distrusted its democratic tendency, coöperation made remarkable headway in imperial Germany as regards distribution, production, and the establishment of people's banks and rural credit societies based on the principle of mutual aid among neighbors. Its progress in Germany was accelerated during and after the Great War. In Italy it has survived the opposition of the Fascists. Coöperative organizations in Russia have experienced a wonderful development during the last fifteen or twenty years, especially since the Revolutions of 1917. Taken under control in 1920 and restored to independence in the following year, their ultimate relation to the socialistic state is still problematic. The International Coöperative Alliance, founded in 1892, gave striking evidence of international good-will during the war, and took steps at the earliest possible moment to bring about a revival of commerce among the peoples of Europe. In 1921 at the Basel Coöperative Congress there were four hundred delegates from twenty-four countries, representing a total membership of 25,000,000. This was felt by many to be the nearest approach to a true league of nations that had ever assembled.

REFERENCES — Blanc, Elsie T.: *Coöperative Movement in Russia*, 1914; Cole, G. D. H.: *Chaos and Order in Industry*, 1920; Fay, C. R.: *Coöperation at Home and Abroad*, 1908; Herrick, M. T. and Ingalls, R.: *Rural Credits*, 1915; Hobson, J. A.: *The Evolution of Modern Capitalism*, revised ed., 1926; Kropotkin, P. A. (Prince): *Mutual Aid*, 1904; Reclus, E.: *L'Evolution, la Révolution et l'Idéal Anarchique*, 4th ed., 1898; Russell, B.: *Proposed Roads to Freedom*, 1919; Warbasse, J. P.: *Coöperative Democracy*, 1923; Wolff, H. M.: *People's Banks — A Record of Social and Economic Success*, 4th ed., 1919.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the state itself is a form of voluntary association.
2. Describe the political ideals of Bakunin, E. Reclus, Tolstoy, or Kropotkin.
3. Show the influence of medieval craft guilds on the organization of the state, the university, the scientific academy, and the Hanseatic League.
4. Trace the early history of trade unionism in Great Britain, dwelling especially on the crisis of 1824.
5. Write an essay of three or four thousand words on "The International Aspect of the Coöperative Movement."
6. Discuss the wisdom of the recent action of the British Coöperatives in entering into a political alliance with the Labor Party.
7. Write a review of *Rural Credits*, 1915, by M. T. Herrick and R. Ingalls, or of *A History of Farmers' Movements in Canada*, 1924, by L. A. Wood; and discuss the applicability of the coöperative principle to the improvement of agricultural conditions.

XXIII

SCIENTIFIC ASSOCIATIONS

For the advance of civilization modern scientific academies and societies are forms of voluntary association of very great importance. Like the universities, they bore at one stage of their development an intimate relationship to the craft guilds, though in some sense they might claim as their archetypes the schools of philosophers and physicians of antiquity. The first Greek philosophers whose names have come down to us had gathered together in voluntary groups or schools, in each of which the prolonged exchange of ideas had produced among the individuals who composed it a likeness if not an identity of doctrine. The Pythagoreans, for example, had formed a brotherhood so compact that the teachings of the master in ethics, politics, mathematics, astronomy, physics, and medicine could not readily be distinguished from those of the disciples. A similar statement, with due qualifications, might be made concerning Hippocrates and the Hippocratic physicians, as well as concerning Plato and his followers, the Academicians. Added to the general impulse to enter into friendly coöperation with one another, learned men find a special motive for association in the need of intercommunication engendered by the pursuit and discovery of truth. Accordingly, with the revival of the research spirit in the fifteenth and sixteenth centuries the earliest modern scientific organizations came into being. The difficulty of tracing their early development, owing in part to the spontaneous and informal nature of their origin, is enhanced by the fact that the very existence of these associations depended on the maintenance of secrecy. Before the middle of the thirteenth century the Church had forbidden membership in societies bound

together by oaths and pledges of brotherhood. Prevented from having their own independent societies, the intellectuals seem to have cast in their lot with the craft guilds, especially with such as cultivated the study of mathematics. In fact, the Germans used the words *Hansa* and *Zunft* to signify either academy or guild. At the same time, in various parts of Europe, the term *academy* or one of its cognates was used to designate the inner circle of a guild. The application of this term to associations of learned men as early as 1439 suggests that the scientific societies of the Renaissance may have claimed descent from the Platonic school at Athens, suppressed, but not destroyed, by order of Justinian in the early part of the sixth century.

The earliest Italian scientific academies of which we have definite information were, like their great Athenian archetype, of too much importance to escape persecution. The first of these was established in 1560 at Naples by Giambattista della Porta, known for his experiments with steam and for his description and improvement of the camera obscura. This society, the *Accademia secretorum naturæ*, to membership in which only those who had made a scientific discovery were eligible, was closed by Pope Paul V in the early years of the seventeenth century in consequence of an accusation of practising the black art. In 1610 Porta was welcomed at Rome by the members of the *Accademia dei Lincei* (Academy of the Lynxes), which had been founded in 1603 by Prince Federigo Cesi. The most distinguished member of this society was Galileo, whose prosecution at the hands of the Inquisition was an extreme instance of the difficulties under which the scientists of the time pursued their investigations. In 1657 the *Accademia del Cimento* (Academy of Experiment) was organized at Florence under the influence of Viviani and other friends and disciples of Galileo and Torricelli. Although this society lasted only ten years before it was forced to disband by the same reactionary forces as had restricted the usefulness of Galileo, its activities gave a great impulse to both the physical and biological sciences. In the accounts of the investigations of the *Accademia*

del Cimento, published in 1667, mention is made of the thermometer, the barometer, the pendulum as a time measurer, and other instruments of precision. Studies are recorded concerning atmospheric pressure, magnetism, electricity, the motions of projectiles, and the speed of the propagation of sound and light. Certain experiments in reference to heat and the compressibility of liquids reveal the influence of Francis Bacon. Galileo's method and point of view told in the investigation not only of physical but also of biological phenomena, as is shown preëminently in the work of his pupil Borelli.

In the north of Europe statesmen and rulers were quick to see the social and political significance of the early scientific societies, and these voluntary associations, although not suppressed, were taken under government patronage and control. Five years before the organization of the *Accademia del Cimento* there had been founded at Schweinfurt, Bavaria, the *Academia naturæ curiosorum*, which in 1687 was taken under the wing of the Holy Roman Empire by Leopold I. In France the history of the Academy of Sciences is comparable with that of the famous *Académie française*. By the astuteness of Cardinal Richelieu a spontaneous association of literary men, who had gathered about Valentin Conrart, were consolidated as the French Academy in 1634, were accorded the patronage of Louis XIII, and assigned the task of purifying and fixing the vernacular by the preparation of a dictionary. The Parliament of Paris regarded this association of prominent men as a menace to its own authority. About the time of the founding of this learned society, a group of scholars interested in physical science and mathematics were in the habit of holding meetings under the leadership of Father Mersenne. Though he was not liberal in theology, Mersenne had an intense curiosity regarding physical phenomena and an ardent desire for the promotion of scientific knowledge. As a friend and old fellow-student of Descartes he had taken pleasure in putting that great philosopher and mathematician in communication with various foreign scientists. Father Mersenne's vivid personality attracted also Pascal,

Fermat, Gassendi, Hobbes, and Petty; he conducted correspondence with Galileo, and many other distinguished scientists. After the death of Mersenne in 1648, the group of scientists of which he had been the center continued to meet from time to time at the home of a M. de Montmort and later at that of Thévenot (1620–1692), the famous traveler. It was Louis XIV's great minister Colbert, celebrated for the organization of the art, literature, and science, as well as of the commerce and industries of France, who in 1666 converted this voluntary association into the *Académie Royale des Sciences*. In 1793 the French Academy, the Academy of Sciences, and similar organizations under the royal patronage, were, by the Convention, suspected of hostility to the popular cause and suppressed. Two years later, however, they were revived, and incorporated as sections of the *Institut de France*, in which comprehensive foundation philosophy, ethics, politics, economics, and history also obtained recognition.

The history of the Royal Society of London is in some respects similar to that of the French and German scientific academies. In its origin it was purely spontaneous, and for some years it remained without official status. As early as 1645, while the war between Charles I and the English Parliament was still in progress, a few scholarly men began to hold informal meetings in London, at which they carried on experiments and discussions. The leaders of the group, Wilkins, Wallis, and Goddard, were young men who, at this critical moment in the political life of England, adhered to the parliamentary side. Theodore Haak, a German, who is credited with having first suggested the formation of the group, was likewise opposed to the pretensions of the king. The family of Robert Boyle, who at the age of eighteen joined this Philosophical (that is, scientific) or Invisible College, as it was playfully called, was soon to be won over in part to the support of Cromwell in Ireland. In 1648 Wilkins became warden of Wadham College, Oxford, and a few years later he married a sister of the Protector. Wallis, who during the war had turned his skill as a decipherer to the account of the forces of the Parlia-

ment, became Savilian professor of geometry in the University of Oxford in 1649. Goddard, after serving as physician-in-chief of the parliamentary army, received appointment as warden of Merton College, Oxford, in 1651. Robert Boyle took up residence near his friends in the university town in 1654. Meetings were held at Wadham or at the private lodgings of the members of the society. These were attended at one time and another by Wren, Rooke, Petty, Hooke, Oldenburg, and others. In the meantime the meetings in London continued, and Gresham College became the regular place of assembly for the group in the metropolis. Here Hooke, Goddard, and Wren accepted professorships, and by 1658 it had become customary for the members to meet twice a week. After the death of Cromwell, however, in September of that year, the unsettled political state of the country interfered with the activities of the society. When Charles II ascended the throne, royalists such as Lord Brouncker, Sir Robert Moray, Evelyn, and Cowley shared the leadership with the Honorable Robert Boyle and Dr. Wilkins. A charter of incorporation was granted in 1662 and His Majesty graciously proclaimed himself the founder and patron of the Royal Society of London.

Accounts of the early proceedings of the Royal Society reveal some of the principles of successful coöperation.¹ The minds of the Fellows had been humbled and clarified by the experiences of the Civil War. They were little inclined to make dogmatic statements themselves, or to accept without qualification the dogmatism of others. Fanaticism and all forms of religious intolerance had for the moment been effectually rebuked. Professional and class prejudices were to a considerable extent held in abeyance, the Fellows expressing the wish to call to counsel all strata of society and to benefit all vocations from the most to the least exalted. They had learned on the battle-field that courage and public spirit are not the exclusive possession of the aristocracy. Moreover, the calamity that had befallen the nation had opened the eyes of all

¹ See also the chapter on "Coöperation in Science" (viii) in my *An Introduction to the History of Science*, 1917.

thoughtful citizens to the virtues and learning of foreign peoples. It became one of the express purposes of the society to promote a universal culture, or a constant intelligence throughout all civilized nations. Inspired by the sentiment of good-will to all mankind, the society was utilitarian, but not so narrowly practical as to preclude an interest in the pursuit of truth as truth. The Fellows held that the mind of the individual is stimulated by the presence of others, and they sought to advance scientific discovery through the corporate action of men. At the same time, however, they were wise enough to realize that every investigator is a law unto himself, and that the rules of successful scientific research do not permit of precise formulation.

As we have seen, the Royal Society of London was, like the *Académie des Sciences*, international from its inception. A few examples will indicate how the spirit of coöperation was maintained for centuries among the scientists and the scientific associations of the civilized world. Christian Huygens, the illustrious Dutch mathematician and physicist, joined the Royal Society as one of the original Fellows in 1663. Two years later he was called to the service of Louis XIV by Colbert, and at the time of its founding was chosen as one of the leaders of the Academy of Sciences. Leibnitz, the German philosopher and scientist, visited England in 1673, entered into friendly relations with some of the leading men of science in that country, and became a Fellow of the Royal Society. Passing over to France, he spent the following years in Paris, received an offer of appointment as pensioner in the Academy of Sciences, and returned to his own country in 1676 an enthusiastic advocate of the founding of a similar institution under the patronage of Prussia. He was convinced that the practical arts in that country were in need of stimulation. He felt that in an international struggle the nation that was the most highly civilized and the best developed industrially was certain to obtain victory. The projected academy might prove to be the means whereby Protestant Germany under the leadership of Prussia would gain in power and influence. In 1700 the plan of Leibnitz

for an academy at Berlin was given official sanction. It was only after the accession of Frederick the Great to the throne, however, that the *Akademie der Wissenschaften* began to prosper under the direction of Maupertuis. That French mathematician and naturalist was sufficiently adroit to bring into the organization as regular or corresponding members some of the chief scientists of Europe. The debt of civilization to the Berlin Academy of Sciences in the eighteenth and nineteenth centuries is indicated by such names as Leibnitz, Euler, Marggraf, Lambert, Lagrange, Achard, Alexander von Humboldt, and Helmholtz. Leibnitz, in addition to the part he played as the promoter and first president of this organization, advised Peter the Great concerning the Imperial Academy of Sciences established at St. Petersburg in 1725, and drew up a plan for a similar institution at Vienna, which was not carried into effect, however, till about the middle of the nineteenth century.

Of the scientific associations organized within the present boundaries of the United States the first, the American Philosophical Society, was modeled after the Royal Society of London, while the second, the American Academy of Arts and Sciences, took pattern from the *Académie des Sciences*. At Philadelphia as early as 1727 Benjamin Franklin had begun to play a part somewhat similar to that of Porta, Mersenne, or Wilkins, in drawing together a group of men interested in the study of natural philosophy. Particularly fitted to reflect in America the utilitarian spirit of the Royal Society, Franklin issued in 1743 a circular setting forth his famous proposal for promoting useful knowledge among the British possessions in America, and, to that end, for forming a society of men, resident in the different colonies, to be called the American Philosophical Society. He insisted on the importance of correspondence, which in the dearth of scientific publications had facilitated coöperation among the scientists and scientific associations of Europe. The transit of Venus in 1769, for the observation of which Captain Cook had been dispatched to the South Pacific at the suggestion of the Royal Society, afforded the American Philosophical Society an opportunity to coöperate in an

investigation of world-wide significance. The results reported on this occasion by David Rittenhouse as chairman of a committee of the American Philosophical Society were the best obtained. The American Academy of Arts and Sciences owes its origin to John Adams, who while visiting Franklin at Paris in 1778-1779 came in contact with some of the French Academicians and recognized that the organization of learning is necessary for the social and political progress of mankind.

It is remarkable that the early history of periodical literature in general is closely associated with that of the publications of the scientific academies and societies of the seventeenth and eighteenth centuries. The *Journal des Savants*, which devoted considerable space to accounts of the advancement of science, and the *Philosophical Transactions*, in which the student of the development of modern science finds the richest supply of material, were among the earliest periodicals in the strict sense of the term. In 1668, three years after the first issue of these publications, the *Giornale de' Letterati*, modeled after the *Journal des Savants*, took its place among scientific periodicals. The *Miscellanea curiosa* of the *Academia naturæ curiosorum*, though an annual, should not be ignored in a historical sketch of periodical literature. In America the *General Magazine and Historical Chronicle*, published in 1741 by the founder of the American Philosophical Society, must also be regarded as among the precursors of our weekly, fortnightly, and monthly publications. These scientific periodicals, like the encyclopedias, which began to assume their modern guise about the middle of the seventeenth century in consequence of the rapid increase of knowledge, were not the least important means of promoting coöperation in science on an international scale.

REFERENCES — Bigourdan, G.: *Les Premières Sociétés de Paris au xvii^e Siècle et Les Origines de l'Académie des Sciences*, 1920; *Cambridge Modern History*, vol. V, chap. xxiii; Conradi, E.: "Learned Societies and Academies in Early Times," *Pedagogical Seminary*, vol. XII, 1905; Goode, G. B.: "The Origin of the National and Scientific and Educational Institutions of the United States," *Papers of the*

Am. Hist. Association, vol. IV, 1890; Graham, W.: *The Beginnings of English Periodical Literature*, 1926; Ornstein, Martha: *The Rôle of the Scientific Societies in the Seventeenth Century*, 1913; *Royal Society of London, The Celebration of the Two Hundred and Fiftieth Anniversary of*, 1912; Simon, J.: "The Centennial of the Institute of France," *An. Rep. of the Smithsonian Institution* for 1895; Sprat, T.: *The History of the Royal Society of London*, 1667; Tannery, P.: *Les Sociétés Savantes et l'Histoire des Sciences*, 1906.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That in the thirteenth, fourteenth, fifteenth, and sixteenth centuries the Christian Church quickened rather than retarded the development of the physical and natural sciences.
2. Write an essay on Academies, explaining the origin of the term and tracing the development of the various types of institution to which it has been applied.
3. Discuss the view that the scientific and other learned societies of Europe were patronized and controlled by statesmen and monarchs as a means of maintaining political supremacy.
4. Write an essay of two thousand words on the early history of the Royal Society of London, stating and explaining the principles of successful co-operation in scientific research.
5. Outline the history of periodical literature, and state your judgment concerning the part it has played in the history of civilization.
6. Sketch the early history of the beet-sugar industry, telling the part played by Marggraf, Achard, and Crespel-Dellisse.
7. Write a brief essay on Colbert or Franklin to illustrate the influence of learned societies on the development of civilization.

XXIV

THE PSYCHOLOGY OF RESEARCH

The history of science gives us valuable information concerning the methods employed by investigators in the past and suggests means of stimulating in the present the spirit of scientific discovery, the application of which in every division of the field of knowledge is one of the chief characteristics of contemporary civilization. We cannot afford to overlook the methods and opinions on methods of the individuals and associations who have contributed by their investigations to the development of the sciences, who have thrown light on the general conditions of successful research, and have brought into special prominence the more fruitful of the logical processes. At the same time we must not ignore the fact that the celebrated physiologists, physicists, chemists, and mathematicians of the past were inferior to the expert psychologists of the present in the ability to analyze mental processes and to use with discrimination the technical terms of mental science. The not infrequent conviction of a discoverer or inventor that at the crucial moment of the solution of a problem he was by no means conscious of special effort may cause him to speak of his experience as an *intuition*, *illumination*, *inspiration*, or a *revelation*, without any attempt whatever to define these terms. Fortunately, however, the testimony of some of the greatest investigators concerning their own scientific methods is given in unmistakable terms or is corroborated in other ways.

Claude Bernard, the greatest French physiologist of the nineteenth century, said that an experimenter should use his imagination as he does his overcoat, putting it off when entering the laboratory and putting it on when leaving. Brodie said that the

creative imagination is both the source of poetic genius and the instrument of scientific discovery. Tyndall was of the opinion that in explaining sensible phenomena the scientist habitually forms images of the ultra-sensible. This seems to have been true of Dalton, whose inclination to think *corpuscularly*, that is, to visualize the atomic structure of elements and compounds, was the foundation of his contributions to the development of chemistry. In the case of Kekulé we have the definite statement of the investigator concerning the discovery of the structural formula of benzene. At Ghent on a certain day, as he tells us, after trying in vain to concentrate attention on the writing of his textbook, he turned his chair toward the fire and fell into a doze. Atoms appeared to flit before his eyes. Smaller groups kept modestly in the background. His mind's eye, which had been sharpened by repeated visions of a similar sort, now distinguished larger structures of various forms. Long rows frequently near together, all winding and turning like serpents! "And behold! What was that? One of the serpents had seized its own tail and the form whirled mockingly before my eyes." It is in a state of reverie, in a dream state, according to Kekulé, that such imagery occurs. The waking mind does not proceed by leaps and bounds. If we learn to dream, he continues, then we shall perhaps find truth. We must take care, however, not to publish our dreams before subjecting them to verification by the waking mind. Kekulé thought that his power of visualization had been developed by his early study of architecture. No explanation of chemical phenomena was satisfactory to him unless he could translate it into definite visual imagery. He did not hesitate to put forward his pregnant discovery of the benzene ring as an illustration of the mental operations of men of genius, and the records we have of the functioning of the imaginations of distinguished poets and novelists tend to confirm his judgment and to set at rest every doubt concerning the reliability of his observation of his remarkable experience. Though this sort of mental activity may seem characteristic of the artist rather than of the man of science, we are forced to admit that the

creative imagination is not a monopoly of poets, painters, sculptors, musicians, theologians, or philosophers. Kekulé's pupil Van't Hoff and others associated with the development of stereochemistry, as well as the scientists who have advanced in recent years our knowledge of the constitution of the atom, would furnish further examples of the use of the imagination in research.

For William James and other psychologists the characteristic of genius is not the possession of imagery of hallucinatory vividness, but the ability to note resemblances among diverse phenomena. The scientific genius lays hold of the general in the particular, and relates nature — multitudinous and apparently chaotic — to a system of ideas or concepts. Here Aristotle stands as the greatest of all examples. He, as Hegel said, pressed his way through the mass of things knowable, and subjected its diversity to the power of his thought. Trained by Plato in conceptual thinking, brought by early education and his own tendencies into full contact with the world of sense, he did more than any other individual to interpret for mankind the meaning of nature. In modern times the *Systema Naturæ* of Linnæus contributed very considerably to the development of botany and zoölogy because, though its classifications were highly artificial, it furnished an impressive array of concepts based on observable likenesses and differences. Comparative anatomy, comparative embryology, paleontology, and the belief in organic evolution suggested more fundamental similarities and dissimilarities between one species and another, or one genus and another, and thus led to a more natural classification of plants and animals. In search of adequate concepts based on essential likenesses and differences the scientist must turn from the sensible to the supersensible world, from the picturesque aspects of nature to a system of general ideas or mathematical relationships. The artist within, adopting the seductive argument of Mephistophiles, may assure him that all theory is gray, and — with characteristic lack of precision — that the golden tree of life is green, but the man of scientific genius, following the narrow path that leads to mastery, concentrates attention on the real and permanent world of

concepts underlying the world of sense. The clarification of concepts forms an important part of the development of the individual as of society in general. It is closely associated with increased discrimination in the use of language. Proficiency in any branch of knowledge involves the ability to employ a special vocabulary. For example, one cannot give a satisfactory definition of a concept so apparently simple as "dog" without having at command a set of technical terms the meaning of which has been fixed in the course of the development of zoölogy. In the middle of the eighteenth century the chemical composition of the so-called "elements" air and water was still unknown, and the terms "oxygen," "nitrogen," and "hydrogen" came into use only as investigation began to clear up the corresponding ideas. The success of research depends to a very considerable extent on the ability to think conceptually and to give thought its adequate expression.

Francis Bacon held that induction is the supreme method of scientific discovery. He began his famous investigation of the nature of heat by calling memory, experiment, and observation into play. He drew up a simple list of hot things, or instances in which heat occurs — the sun's rays in ordinary circumstances, flame, objects subjected to friction, boiling liquids, and certain living animals. By the side of these positive instances he placed a number of negative instances — the sun's rays on a mountain top, the oblique solar rays in the arctic regions, the moon's rays, etc. He suggested the experiment of concentrating the rays of the moon, of a candle flame, and the radiated heat of boiling water, by means of a convex lens. Use a concave lens on solar rays and note the effect. He drew up also a list of instances in which varying degrees of heat occur. Birds are warmer than mammals; the more one strikes an anvil the hotter it becomes; the calendar glass (thermoscope) shows a greater expansion of air with an increase of temperature. Induction must seek to advance from particular cases, presented to the understanding, to a general concept. The problem is to find the conditions that are always present or absent with the property under consideration, and to determine what

always increases and decreases with it. The elimination of false assumptions is an essential part of true induction. Since hot metal may give forth heat without loss of weight, heat is not a substance; and, since boiling water is hot but not luminous, heat must not be confused with luminosity. After coming to a conclusion as to what heat is not, says Bacon, the understanding may venture an affirmation, guided by the more striking instances. *Motion is the genus of which heat is the species*. This judgment, which assumes a relationship between two concepts, constitutes a hypothesis.

Should the hypothesis guide and control the investigation, or should it only follow a careful and prolonged study of facts? John Hunter, who thought that Bacon had been the chief cause of the progress of science in the seventeenth and eighteenth centuries, resolved at the beginning of his career to make a close and comprehensive observation of natural phenomena the basis of his own generalizations. Darwin, who collected specimens for years with a minimum of presupposition as to general biological theories, described himself as having proceeded on true Baconian principles. Claude Bernard, however, speaking of the type of investigation with which he was most familiar, said that the experimenter must know what he is looking for, or he won't be likely to find it. Yet it is noteworthy that this great experimental physiologist allowed his observations to be so little biased by assumptions that he did frequently find what he was not looking for. When he tried to find out, for example, at what point in the circulation of an experimental animal an injection of cane-sugar treated with gastric juice loses its identity, he discovered the glycogenic function of the liver; when he tried to find out what influence the sympathetic nervous system exerts on the body temperature, he discovered the vaso-motor nerves; and when he tried to find out the effect of the vagus nerve on the hepatic circulation, he discovered a means of producing artificial glucosuria. His master, François Magendie, is generally considered to have followed methods far more haphazard. "He compared himself," says Fielding Garrison, the historian of medicine, "to a rag-picker (*chiffonnier*), who wanders

through the domain of science collecting whatever he finds. This expressive phrase sums up the hard limitations which Magendie put upon himself or which existed in his own mind. He discovered only isolated facts, did not try to connect them with one another by any special hypotheses, and so arrived at no important generalizations." Bacon summed up his own attitude toward the pursuit of truth by comparing one type of investigator with the spider, another with the ant, and a third with the bee. The spiders are the wild theorists, who produce from their inner consciousness vague and unverified hypotheses; the ants are the slaves of facts, who feel no impulse toward generalization; while the bees are those who proceed from the data gained by observation to the formulation of principles.

Analogy may furnish the investigator with a working hypothesis. In 1811 Courtois discovered in the ashes of sea algae a substance which for two years the French chemists were unable to identify or explain. It was something new in human experience. How was one to tackle it? Davy arrived in Paris, and almost immediately Gay-Lussac published his well-known paper on iode. Davy, who named it iodine, recognizing it as analogous to chlorine, with which he was particularly well acquainted, worked out its chief characteristics with great rapidity. Conceiving it as a halogen, he proceeded on the assumption that the reactions of iodine would be similar to those of chlorine. Of course organic chemistry presents us with a regular system of analogical compounds. Note, for example, the alcohols, their relations to the radicals — methyl, ethyl, etc. — on the one hand, and to the aldehydes and the organic acids on the other. The relationships in one group or series afford a clue to the relationships in the other groups or series. Again, what is the Periodic Table but an arrangement of eighty and more so-called elements in analogous groups and series? The writings of Mendeleeff illustrate very definitely the method of reasoning by analogy. He argues that *since* cadmium and tin, the analogues of indium, may be reduced from their solutions in a certain way, indium may be obtained in the same way. "Hydrogen sulphide

precipitates Cd and Sn from acid solutions, *consequently* indium is also precipitated. All these reactions have been confirmed by experiment." One of the most striking instances of the use of analogy in research was Mendelejeff's prediction of the discovery of scandium, gallium, and germanium. In reference to germanium, for example, he predicted the atomic weight as 72 (actually 72.5), the specific gravity as 5.5 (5.469), the atomic volume as 13 (13.2), the specific gravity of the oxide as 4.7 (4.703), and the boiling point of the ethyl compound as 160 (160).

Turning our attention to another scientific field, we find that Lyell and other geologists formulated the doctrine that all the changes that had ever taken place in the earth's crust had resulted from agencies still in operation — the action of the surf, the rain on the mountain tops, the slow wearing away of the beds of the rivers, the gradual formation of the coral islands and the uplifting of the mountain ranges. These scientists would not admit that at any time in the past there had occurred great sudden transformations, universal deluges, and the like. Now suppose we, attempting to reason by analogy, apply the uniformitarian principle to the changes that have taken place in the organic world. That is what Darwin, the disciple of Lyell, did.

What then are the mental processes involved in scientific discovery? The imagination certainly plays a part. Kekulé's detailed account of the use of the creative visual imagination in the formation of the theory of the benzene ring is convincing in respect to that. Images, or sense impressions, furnish the material of imagination. As compared with them, concepts, the units of conceptual thinking, are less picturesque. Some pages of scientific discourse fail to arouse a single vivid image. Concepts indicate meaning and may not suggest form or color. We combine them into judgments, such as, "All mammals are vertebrates," "All carnivora are mammals." Through judgments we pass to inferences, that is, we reason by the inductive or the deductive method. At one stage of the inductive process we venture on a hypothesis; that is, on the basis of an examination of a number of instances of a certain class of phe-

nomena we make an assumption in reference to all possible instances of that class. We employ analogy when we compare the relation of two concepts with the relation of two other concepts, as, for example, when we compare the relation of ethyl alcohol to ethane with the relation of methyl alcohol to methane.

In addition, the psychology and logic of research must take into account such matters as the nature and advantages of scientific law, the value of the genetic method, the effect of social stimulation on the investigator, the special indebtedness of science to the vocations, the function of scientific experimentation, and the discovery of causes. The difference between scientific law and civil or criminal law is neatly expressed by Pearson, who says that the one is descriptive while the other is prescriptive. A single scientific law may explain a number of apparently diverse phenomena and direct us in the work of research. Again, failure to trace the origin and development of phenomena is like substituting the description of a cross section for the description of a complete organism. It is, in fact, the ignoring of a dimension. The need of coöperation in research, recognized so clearly by the Royal Society, has been repeatedly reaffirmed. Even the most independent creative genius is at times not without a sense of the necessity of social sympathy and stimulation. The effect of one special type of social stimulation is attested by the history of the alliance between research and modern industry. The lack of close contact between the intellectual leaders and the industrial life of classical antiquity is reflected in the shortcomings of Greek and the poverty of Roman science. Finally, through experiment the investigator is able to isolate the essential from the unessential antecedents of phenomena, the importance of which achievement will be emphasized presently.

REFERENCES — Dewey, J.: *How We Think*, 1910; Jevons, W. S.: *Principles of Science*, 1912; Libby, W.: "The Scientific Imagination," and "Conceptual Thinking," *The Scientific Monthly*, 1922; Nutting, P. G.: "Research and Industry," *The Scientific Monthly*, 1918; Pearson, K.: *The Grammar of Science*, 1911; Poincaré, H.: *Science and Hypothesis* (English translation, 1905); Rignano, E.: *The Psychology of Reasoning* (translated by W. A. Holl, 1923); Schiller, F. C. S.: "Scien-

tific Discovery and Logical Proof," *Studies in the History and Method of Science*, edited by C. Singer, 1917; Westaway, F. W.: *Scientific Method*, 1919.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That clear thinking has played a greater part than has imagination in scientific discovery.
2. What views prevailed in the Royal Society of London concerning scientific methods?
3. Explain in terms of recent psychology the mental processes described as *intuition*, *illumination*, *inspiration*, or *revelation*. Do these processes lead to valuable scientific results except in the case of persons familiar with the facts and problems of science?
4. Discuss the view that the attainment of clear ideas (concepts) depends on command of language. (Reference to the work of Davy and Faraday, John Hunter and Virchow might help the discussion.)
5. Should the hypothesis guide and control the investigation, or should it only follow a careful and prolonged study of facts?
6. Show the relation between the uniformitarian doctrine of the geologists and the theory of organic evolution.
7. What is the genetic method? Explain its application to the data of anatomy, psychology, or political science.

XXV

THE PSYCHOLOGY OF RESEARCH (*continued*)

According to Francis Bacon we are justified in asserting that to know a thing truly implies a knowledge of its causes (*vere scire esse per causas scire*). The utility of knowledge is a guarantee of its validity. The roads to knowledge and power lie close together; where causes are known, effects may be produced. In the same spirit John Stuart Mill says that of all truths relating to phenomena the most valuable to us are those which relate to the order of their succession. The knowledge of causes, the knowledge of the invariable and unconditional antecedents of phenomena, places in our hands the means of control. Indeed, the history of science bears witness that the desire for true knowledge, the knowledge of causal relationships, has led mankind to the knowledge that is power.

A glance at the history of the study and treatment of malaria will furnish a good illustration. In the seventeenth century Thomas Sydenham, the illustrious English physician, though he was very successful for his time in the treatment of malarial fevers, assumed an indifferent and rather skeptical attitude toward the discovery of the ultimate causes of disease. He compared the physician to the farmer or the pilot; it is the duty of the farmer to produce results, not (thought Sydenham) to theorize in reference to the chemistry of plants; it is the duty of the pilot to bring the ship into harbor, not to speculate on the nature of the tides. With a view to their treatment Sydenham sought to reduce all diseases to clearly defined species, and to find a specific remedy for each. He was the first to differentiate, satisfactorily, smallpox from measles, to identify certain so-called forms of hypochondria with

hysteria, and to establish the concepts "chorea" and "scarlatina." Through his example and advocacy the use of Peruvian bark in the treatment of malaria became popular in England. He could not altogether evade the problem of causation. He vaguely associated malarial fevers with a swampy environment, and thought that diseases in general were owing to the presence of mineral effluvia in the atmosphere, to the fermentation of the blood and of other fluids in the body, and to similar obscure conditions. He reached the conclusion, however, that etiology was a difficult and perhaps inscrutable matter, and that the discovery of the essence or intimate nature of diseases was beyond the range of his intellectual powers, if not, indeed, permanently hidden from all men. In contrast with Sydenham's attitude is that of the eager investigators of the nineteenth century who furnished mankind with new weapons and new tactics to check the ravages of malaria and other diseases of which he despaired of finding the causes. In 1820 Caventou and Pelletier discovered in quinine (the essence or curative principle of Peruvian bark) the real specific for malaria. In 1880 Laveran observed in the blood of patients suffering from malaria the pathogenic parasites, to which, as we now know, quinine proves fatal. In 1895 Ross began his investigations of the insect carrier of the parasite, and thus opened a new chapter in the prevention of a disease long known as the most threatening to the advance of civilization.

The history of physical and natural science in general supports the opinion of Mill that the notion of cause is the root of the whole theory of induction. Copernicus considered it the duty of an astronomer to observe the motions of the heavenly bodies, and then, as far as possible, determine the causes of these motions. In 1666, less than twenty years after it had been shown that atmospheric pressure is much less on a mountain top than at sea level and that, therefore, the air does not extend many miles from the surface of the earth, Newton, as he tells us, began to think of gravity as extending to the orb of the moon. On the basis of the astronomy of Kepler, who had described the motions of the planets

about the sun, and of the dynamics of Galileo, who, conceiving of force as the sole cause of motion, had ascertained the laws of falling bodies, Newton set forth the doctrine of universal gravitation. Thus by a single kind of force he explained a great number of effects — the motions of the satellites in their orbits about the planets, the motions of the planets in their orbits about the sun, the deviations from their orbits caused by the mutual attraction of the planets, the ebb and flow of the tides, and many other physical phenomena. Newton's doctrine was corroborated by observations of the motions of the planet Uranus, after its discovery by Sir William Herschel in 1781, and by observations of Ceres, Pallas, Juno, and Vesta, discovered in the opening years of the nineteenth century. Efforts to ascertain the cause of slight irregularities in the orbit of Uranus led to the discovery of Neptune in 1846. Franklin's explanation of the lightning and the tempest, and many other illustrations of the part played in the progress of physical science by the establishment of causal relationships, will readily occur to the reader.

Modern physical science, less concerned with studying the classification and the final purposes of phenomena than with discovering their material and efficient causes — the structure and combination of atoms, and the processes by which things are brought into existence — succeeded before the middle of the nineteenth century in formulating the great unifying principle of the conservation of energy, as it has been called. What Bacon had set forth in the early part of the seventeenth century concerning the nature of heat had been confirmed in the closing years of the eighteenth by the experiments of Rumford and Davy. In 1820 Oersted discovered a relationship between magnetism and electric currents. In 1838 Joule, at the age of nineteen, prepared a paper describing an electro-magnetic engine. As early as 1840 he investigated experimentally the production of heat by means of voltaic electricity, and three years later, in giving an account of an experiment concerning the heat evolved in the electrolysis of water, he stated that the whole quantity of heat in the circuit is the exact equivalent of

the whole chemical change. Subsequently — in August, 1843 — he read before the British Association his essay “On the Calorific Effects of Magneto-Electricity and on the Mechanical Value of Heat.” In this contribution he maintained that for whatever mechanical force is expended an exact equivalent of heat is always obtained. Whenever energy passes from one form to another, there is a definite quantitative relationship between the effect and the efficient cause. Energy, like matter, cannot be destroyed, though it may be transformed. The sum of the potential and kinetic energies is constant. As Faraday stated, in no case is there a pure creation or a production of power without a corresponding exhaustion of something to supply it. For Helmholtz the verification of the principle that the quantity of force which can be brought into action in the whole of nature is unchangeable was one of the chief tasks of science (*Ueber die Erhaltung der Kraft*, 1847). We shall not pause to trace the practical results of the discovery of the principle of the conservation of energy or to consider the consequent modification in the minds of logicians of the idea of causation.

In the biological sciences, as in the physical, the most notable advances of the nineteenth century arose through the discovery, or the quest, of causes. Why do whales resemble both land animals and fishes? How shall we account for the likeness of the flipper of the seal, the leg of the horse, the wing of the bat, and the hand of man? Why has the giraffe the same number of cervical vertebrae as the elephant? Why are the bones of the catfish skull similar to the bones of the human skull? Why do stages in the embryonic development of man bear resemblance to stages in the development of the lower animals? Why is the vermiform appendix in man especially liable to disease? How are we to account for the birth of monsters? Why does fossil man differ in skeletal structure from the normal human type? What will explain satisfactorily the differences between the Australian and the Celtic races? Why are the fossil mammals of Australia marsupials? Why do the fossil animals of South America resemble, yet differ from, the living animals? Why are the fauna and flora of oceanic is-

lands similar to, yet different from, the fauna and flora of the continents from which they are most accessible to invasion? Why do plants and animals admit of being classified in genera, orders, phyla, and so forth? Why does the dog resemble the wolf, the wolf the fox, and the horse the zebra? The theory of organic evolution, comparable in importance with the principle of the conservation of energy, undertakes to answer these and many other questions on the assumption of common inheritance and natural selection, analogous, as we have seen, to the artificial selection employed in plant and animal husbandry.

We have already indicated that the development of the etiology of diseases, or the science of their efficient causes, has put in the hands of man the means of prevention and control. Among the Babylonian and Egyptian priests, as among the medicine men of the aboriginal tribes of North America, disease was ascribed to the influence of gods and demons, the malice of the dead, or the magic of the living. It was through the teachings of the Hippocratic school of medicine that the Greek art of healing was freed to some extent from the shackles of primitive superstition. The brief Hippocratic treatise on epilepsy, the so-called Sacred Disease, shows that it is no more and no less sacred than malaria or any other bodily ailment. All diseases are due to natural causes. It is no compliment to the gods, the argument continues, to attribute to them the hateful manifestations of morbid conditions. On the positive side, the Hippocratic writings taught that disease was due to injudicious diet, to the unwholesome state of the atmosphere, and to the disproportion of the blood, bile, lymph, and other humors of the body. In modern times the most famous landmark in the development of etiology was the work of Morgagni, the father of pathology, *Concerning the Seats and Causes of Diseases Investigated by Anatomy*. The data supplied by his own numerous post-mortems, as well as by those of his forerunners, enabled him to describe the appearance of the organs following death from apoplexy, pneumonia, syphilis, hydrophobia, tetanus, and other diseases. Bichat, the French anatomist and pathologist, in analyzing

the organs of the body into their various tissues, went a step further than Morgagni and placed the etiology of disease on a histological basis. Virchow in turn, inspired by the discovery of the cell as the morphological unit of the tissues of plants and animals, saw in the morbid condition of the cells the essential cause of disease. Thus in the course of the centuries the humoral pathology of the Hippocratic physicians was replaced by a pathology of the organs, of the tissues, and of the cells. After Virchow's cellular pathology had become well established, Pasteur, Koch, and others proved that a large number of diseases are caused by bacteria and may be prevented or controlled by the use of inoculations — as we shall see presently in the case of anthrax — and by other means. Moreover, the progress of parasitology toward the end of the nineteenth century and at the beginning of the twentieth revealed the cause not only of malaria, but of hookworm infection, endemic dysentery, sleeping sickness, syphilis, and various other diseases, and thus contributed to their prevention or cure.

Bacilli had been observed about the middle of the nineteenth century by Davaine and other investigators in the tissues of animals that had died of anthrax. The causal relationship between the microörganism and the disease was soon assumed and in part demonstrated. Delafond, for example, announced in 1860 that he had examined the blood of experimental animals before and after they had been inoculated by him with the anthrax virus, and that he had observed a rapid increase in the number of the organisms from the time of their first appearance (one to five hours after the occurrence of the first symptoms of the disease) till death. It was only after the announcement by Pasteur of the germ theory of fermentation, however, that the significance of the discovery of the anthrax bacillus was fully realized. In 1863 Davaine, struck by the resemblance in form between the organism that causes butyric fermentation and the one which he had observed as early as 1850 in the blood of a sheep which had died of anthrax, became convinced that the latter organism was the cause of the disease. He supported his assumption by experiments, and Pasteur

helped to meet some of the criticisms directed against it. But it was reserved for Robert Koch to give, in 1876, a complete demonstration of the etiology of anthrax. He observed the bacilli in the tissues of animals suffering from the disease, and he succeeded in passing it by inoculation from one to another through a series of twenty mice. He showed that anthrax bacilli develop to a remarkable size and produce spores if placed in blood serum or in the aqueous humor of an ox's eye. Spores transferred to a fresh specimen of aqueous humor took on the form of typical anthrax bacilli. After thus tracing the developmental history of the microörganism, Koch was able to produce the disease by means of the injection of the pure culture. In this procedure every source of error was precluded, and the causal relationship of *B. anthracis* to the disease was definitely established. The microörganism is, in the phraseology of Löffler, the sole cause of the disease (*die alleinige Ursache der Krankheit*). In 1877 Pasteur undertook investigations concerning the prevention of anthrax in sheep and cattle, and four years later his method of protective inoculation proved efficacious.

A cause has been crudely defined as something which produces or brings about something else. Some writers hold that the will is the only direct evidence we have of causation, and that it is only by a species of personification that we impute causal relationships to objective antecedents and consequents. As Hume and others have recognized, we learn nothing by observation concerning the connections of cause and effect which bind phenomena together and render them inseparable. Even our voluntary movements, which are supposed to afford us a clue to causal relationships in general, have their origin in reflex and instinctive, that is, in non-voluntary movements, and the sense of effort, which seems the very essence of volition, is the effect and not the cause of movement. We are ourselves in the stream of cause and effect. It is not improbable that the sense that our willed actions are the effects of combinations of mental and physical conditions beyond the range of our analysis makes certain objective consequents appear as the necessary and invariable results of certain antecedents. Primitive

people may regard night as the cause of day, an invariable antecedent giving birth to an invariable consequent. We, however, conceive of day and night as species of light and darkness. Placing the sun among the sources of light, we recognize the turning of the earth on its axis as one of the causes of the day's succeeding the night. We know that in the moon or the sun the alternation of light and darkness, which to an African tribesman seems inevitable, does not occur, and that in the polar regions the ordinary conception of day and night is inapplicable. An effect must be ascribed not to a single antecedent but to a set of conditions. Even the anthrax bacillus produces its characteristic effects only on a few species of animals. We may be inclined to point to the lighted match rather than to the powder, to the event rather than to the state, to the event immediately preceding the effect rather than to one more remote, to the responsible — or irresponsible — person rather than to his ancestry, education, or other circumstances. The scientific investigator, however, should be acquainted with all the pertinent antecedents of the phenomena under consideration.

REFERENCES — Columbia Associates in Philosophy: *An Introduction to Reflective Thinking*, 1923; Creighton, J. E.: *An Introductory Logic*, 1912; Hibben, J. G.: "Logic," *Ency. Am.*, 1925; Joseph, H. W. B.: *Introduction to Logic*, 1906; Löffler, F.: *Die geschichtliche Entwicklung der Lehre von den Bakterien*, 1887; Mill, J. S.: *System of Logic*, 9th ed., 1900; Poincaré, H.: *Science and Method* (English translation, 1915); Schiller, F. C. S.: *Psychology and Logic in Psychology and the Sciences*, 1924; Sidgwick, A.: *The Application of Logic*, 1911; Russell, B.: *Our Knowledge of the External World as a Field for Scientific Method in Philosophy*, 1914; Woodworth, R. S.: *Psychology — A Study of Mental Life*, 1921.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the various species of plants and animals are the results of special creation rather than of evolution.
2. Do you consider the discovery of the Law of the Conservation of Energy a fair example of the establishment of causal relationships? Discuss with reference to the researches of Joule and Faraday.

3. Give an account of the discovery of Neptune, laying emphasis on the process of reasoning from effect to cause.
4. To what extent was Sydenham right and to what extent was he wrong as regards the chief duty of a physician, his attitude toward the discovery of causes, the necessity of establishing clear medical concepts and careful diagnosis, and the supreme importance of therapeutics?
5. Sketch the development of etiology in the history of medicine. Do you think that Koch proved absolutely that the microörganism *B. anthracis* is the sole cause of anthrax? Discuss the view that an effect must be ascribed to a set of conditions rather than to a single antecedent.
6. "We are ourselves in the stream of cause and effect." Explain and amplify this statement.

XXVI

PERSONAL CHARACTER

Sensation, perception, memory, imagination, conception, discrimination, judgment, and reason, which, as we have seen, form the intellectual equipment of the scientific discoverer, represent only one phase of personality. On the assumption that man is above all a rational being, they have been made the subject of prolonged investigations. The method and the point of attack of these studies were, before the end of the seventeenth century, especially influenced by Locke, the English philosopher and psychologist. Impressed by Sydenham's success in defining species of disease on an empirical basis, he undertook the task of classifying the contents of consciousness. He maintained that all our ideas arise either from sensation, the experience of external things, or from reflection, the experience of the internal operations of the mind. He was chiefly concerned with tracing the more complex intellectual processes from the simple sensory elements, though he did not altogether deny that the unborn child may have experience of hunger and other sensations, that the desire of happiness and the dread of misery are congenital, and that the will is to be distinguished from the intellect. Today it is very clearly recognized by philosophers and psychologists that in order that they may deal satisfactorily with the analysis and classification of personalities they must take account of native dispositions, impulses, instincts, feelings, volitions, and habits, as well as of the intellectual or cognitive processes. "What are we," says Bergson, "what is our *character*, if not the condensation of the history we have lived from our birth — nay, even before our birth, since we bring with us prenatal dispositions? Doubtless we think with only a small part of our past, but

it is with our entire past, including the original bent of our soul, that we desire, will, and act."

According to Professor McDougall the most fundamental need of psychology, the science of human nature, is at the present time the recognition of the importance of the conative factor in mental phenomena. For him, as for Bergson, life is tendency, endeavor, *Bestreben*. Human life from birth till death is one long series of purposive strivings. Even in our dreams, as Freud has shown, the striving does not cease. The goal toward which the individual directs his course may be remote or near, vague or precisely defined. Besides the differences in the proximity and clearness of the objective, there are also differences in the intensity and persistence with which one pursues it. Nevertheless, striving is all-pervasive, governing both the conscious and the subconscious life. It is common to the instinctive activities of the lower animals and to the steadfast, purposive endeavors of a resolute personality. No picture of mental life is adequate which relegates to the background impulses, desires, motives, and aspirations. If purposive striving be identified with the will, then the will must be candidly accepted as dominating all the other processes of the mind, not only the reason and the attention but also the perception and the memory. The purposes of our fellow men, their essential mental life, are revealed to us through a sympathetic observation and interpretation of the course of their lives. "Instead of accepting the abstract conceptions of physical science and attempting to build up a plausible mechanical dummy which shall stand for man in our science, let us frankly acknowledge that man is that thing in all the world with which we have the most intimate acquaintance. Let us begin by accepting him for what he seems to be, a thinking being that strives to attain the goals he desires, to realise his ideals, sometimes succeeding, often failing, but always striving so long as he lives." The most recent researches in this special field confirm McDougall's judgment in reference to the importance in personal character of the persistence of motives and consistency of action resulting from volition,

without, however, renouncing the assistance of any part of organized knowledge.

It has long been known, of course, that the mind is a unit, and that intellect, feeling, and will are not mutually exclusive categories. Reason has been expressly described as purposive thinking. In deduction such premises are selected as give promise of a relevant conclusion. The construction of the syllogism is dictated by the problem to be solved. We are asked, for example, whether or not armadillos are mammals. In order to arrive at an answer to this question by means of the syllogism, a major premise must be laid down that will express the relation of the more general of the two concepts to a third concept, more extensive than the one and less extensive than the other. *All X's are mammals; all armadillos are X's; therefore, all armadillos are mammals.* An exercise of ingenuity is required to hit upon a concept to mediate between the two given concepts. The desire to reach a conclusion guides the selection. Similarly in inductive reasoning, the particulars are selected with the purpose of affording grounds for an anticipated generalization. As William James pointed out many years ago, the relative intensity of two sensations may be changed when one of them is attended to and the other not. Every elementary treatise on psychology speaks of willed, or voluntary, attention. The presence of a conative element in perception is generally acknowledged. The like is true of memory and recollection. A witness in a murder trial states that he has a very vivid memory of his own actions and whereabouts on the morning of October 4, the day of the alleged crime. He remembers precisely what he was doing at 10:20 when interrupted by the sound of a struggle in an adjoining building. What had he been doing on the morning of October 3? He does not know; in his own phraseology, he didn't burden his mind with it. What did he do on the morning of October 5? He does not remember; perhaps that was the day of the inquest.

Conation is no less closely associated with the affective than with the cognitive processes. The relation between the emotions and the instincts, the roots of volition, is obvious. The survival

value of anger, associated with the fighting instinct, and of fear, associated with defense by flight, was noted by John Hunter in the eighteenth century. Darwin showed in general that the expression of the emotions in animals is directly connected with the instinctive activities. Recent investigations have proved that the physiological changes which occur in animals when they become aware of the approach of an enemy are a preparation for attack or escape and, at the same time, cause manifestations of emotional excitement. An emotional experience would be wanting in its characteristic quality if unaccompanied by any volitional tendency. Wundt went so far as to declare that an emotion together with its result is a volitional process. Emotions and sentiments are the common source of voluntary activity. There is no feeling that does not involve an effort to reach some goal. A sentiment, as distinguished from an emotion, is an alignment of the affective and conative processes with reference to certain persons and things. It is a system of processes, fraught with the potentiality of a great variety of active tendencies and so complex as hardly to admit of scientific analysis. Here we welcome Dewey's statement that the novelist and dramatist are so much more illuminating as well as more interesting commentators on conduct than the schematizing psychologists.¹ In the present inchoate state of the science of human nature we turn to the fine arts for assistance in the appreciation of the affective and volitional processes and in the delineation of personal character.

The testimony of the great literary artists with regard to human character is, to say the least, a valuable supplement to that of the professional psychologists. Browning, for example, expresses with particular incisiveness the claims of effective volition:

Let a man contend to the uttermost
For his life's set prize, be it what it will!

How strive you?

¹ *Human Nature and Conduct*, pp. 155, and 323-324.

In a similar spirit Goethe represents as the redeeming virtue of Faust a ceaseless striving and aspiration:

Es irrt der Mensch so lang er strebt.

Des Menschen Tätigkeit kann allzuleicht erschlaffen,
 Er liebt sich bald die unbedingte Ruh;
 Drum geb' ich gern ihm den Gesellen zu,
 Der reizt und wirkt und muss als Teufel schaffen.

The emphasis laid by Homer and Tennyson on the enterprise and hardihood of Ulysses, Shakespeare's treatment of vacillation, or apparent vacillation, in *Hamlet*, the insistence in *The Two Noble Kinsmen* on the importance of action (in addition to feeling and thought), Milton's sympathetic portrayal of the unconquerable will of Satan, and Ibsen's description of Brand, will also indicate to what extent the great poets have contributed to our appreciation of the essentials of personality. Among novelists, Turgenev has made weakness of will the chief theme of more than one of his works, while Paul Bourget, in André Cornélis, depicts a modern Hamlet, compelled by filial sentiment to punish a murderer of whose guilt he has no proof. Tortured by inhibited volition, sacrificing his youth on the altar of vengeance, he reproaches himself with lack of decision even while bending all his energies to the accomplishment of one purpose.

The character of one man differs from that of another in the choice of a purpose and of the means of achieving it, in the constancy and consistency of the resulting conduct, and in the nature of the emotional experience involved. In Shakespeare's *Hamlet*, for example, there is a well-marked contrast in these respects between the Prince of Denmark and his father. The latter is a typical man of action, a soldier free from the restrictions of a too lofty idealism, prone to anger, and not unduly scrupulous in the assertion of his rights. Little subtlety is called for in his delineation. He is a complete man, with good judgment and common-sense aims. Knowing precisely what he wants, he is not at all

flighty or peculiar, but pursues his purposes with steady determination. The Prince of Denmark, on the other hand, is a man of thought and feeling rather than a man of action, a student versed in the lore of the German universities and interested in Greek and Italian literature, a connoisseur and patron of the drama, and a model of good form and elegant deportment. He is much more complex and sophisticated than his father. Suddenly called upon to pursue a disinterested purpose, for which he abandons his earlier ends, he appears inconstant and inconsistent, without poise, so upset by the task put upon him by fortune that he doubts his own fitness and resolution, and resorts to means that seem needlessly indirect in the judgment of men of less delicacy and refinement. Unlike his virile father, he is so overwrought emotionally as to be irritated by inappropriate phraseology and affectation of speech or manners and maddened by exaggerated sentiment and hypocrisy. He is a transition character, a character in course of development, a lover awakened from his dreams to a sense of public business and social responsibility in a peculiarly trying crisis, in which the persons nearest him in blood and affection are the objects of the gravest suspicions and the tools and dupes of the enemies of the commonwealth. Like many a young man of the present generation, he strives in vain for a new and higher synthesis of thought, feeling, and action. He is superior to his father in intellectual outlook and emotional refinement, but appears inferior in volition — an apparent inferiority owing partly to his youth, partly to the complexity of social conditions, and partly to the difficulty of fixing upon a line of conduct not repugnant to the dictates of his judgment and sentiments.

If we venture on an inquisition regarding personal character, Browning's incisive question — *How strive you?* — might be expanded with reference to any individual, to the great Elizabethan dramatist himself, for example. What did he try to do? How hard did he try? By what feelings was he actuated? How did the youthful poacher and rustic satirist of 1585 become the urbane poet-philosopher of 1611? How does Shakespeare compare with

Napoleon as regards the main purposes of life, the steadfastness with which the objective was sought, and the intensity and delicacy of the sentiments involved? Strength of will is gauged by the degree of perseverance shown in pursuit of the chosen object, and of persistence and courage in the face of disappointment and opposition. From this point of view the man of character is he who concentrates attention on the things essential to his purpose, and inhibits all thoughts and tendencies that endanger his plan. He is active rather than passive, creates his own opportunities, looks cheerfully on failure as a form of stimulating exercise, and is more intent on what he is doing to the world than on what it is trying to do to him. As already implied, the selection of a purpose and of the means of arriving at its fulfilment — whether violence, or persuasion, or, again, a serene exposition of the truth — is, no less than perseverance, an index of character. Equally important are the sentiments that influence conduct, such as the desire for the gratification of the senses, avarice, envy, parental love, love of public approbation, patriotism, the humanitarian sentiment, universal benevolence, and hatred of injustice. The difference between a worthy *paterfamilias*, absorbed in the task of providing for wife and offspring, and a St. Francis of Assisi, with sympathies as broad as nature, is best explained by reference to the organization of the sentiments. The development of character in general implies the conception of new ideals, the steady approximation of purpose and conduct, and such an increase in the range and intensity of the social sentiments as the advance of civilization demands.

The classification of characters with reference to the ancient doctrine of the four humors deserves mention, if on no other ground, on account of its historic importance and the light it throws on the interpretation of literature and the other arts. For example, in Shakespeare's *Julius Cæsar*, written a year or two before *Hamlet*, there is evidence that the dramatist had in mind this theory of the temperamental differences of men. Anthony, impetuous and inconstant, is typical of the sanguine temperament. Octavius appears in the play, as he was in reality, phlegmatic. The

choleric Cassius expressly acknowledges the rash humor that characterizes him. Brutus, though the eulogy pronounced over him in the closing scene might seem to imply that in him all the elements, or humors, were harmoniously blended, represents the classical atrabiliary temperament, firm and inflexible. In some respects he challenges comparison with the melancholy Dane. The doctrine of the four humors has left its trace in the history of pictorial art as well as in the history of *belles lettres*. For instance, in Dürer's painting of the apostles St. John and St. Peter, of St. Paul and of St. Mark the Evangelist, four distinct types of character are portrayed. Even in the interval between the production of this masterpiece and the death of the artist the opinion was widely held that the picture was actually designed as a representation of the four temperaments, as its popular name (*die vier Temperamente*) indeed indicates. Recent discoveries concerning the influence on the emotional life of the internal secretions lend new interest to the old and persistent belief in the relation of the various temperaments to the bodily humors.

In *The Tempest* of Shakespeare, the consummate achievement of the greatest student of men in their social relations, the several characters of the drama are clearly differentiated with reference to a threefold antithesis — between the altruistic and the egoistic, the spiritual and the sensual, the natural and the conventional. Gonzalo, characterized by a disinterested love of mankind, is almost a symbol of altruism; while Antonio, the usurping duke, typifies an exaggerated egoism. In the second place, Caliban is so plainly sensual as to suggest his affinity to a subhuman stock; while, in contrast with him, Ariel is almost pure spirit with scarcely a vestige of human emotion. Finally, Alonso and his court stand in antithesis to the natural characters making up the ship's crew as well as to one or two unconventional characters on the island.

REFERENCES — Cannon, W. B.: *Bodily Changes in Pain, Hunger, Fear and Rage*, 1915; Jastrow, J.: *Character and Temperament*, 1915; Libby, M. F.: "Shakespeare and Psychognosis," *University of Colorado Studies*, 1906-1907; McDougall, W.: "Purposive Striving as a Fundamental Category of Psychology," *Rep. of the 92d*

Meeting of the British Association for the Advancement of Science, 1925; Shand, A. F.: *The Foundations of Character*, 1920; Spearman, C.: *The Abilities of Man*, 1927; Thorndike, E. L.: *The Original Nature of Man*, 1913; White, W. Alanson: *Mechanisms of Character Formation*, 1916; Woodworth, R. S.: *Dynamic Psychology*, 1917; Vincent, S.: *Internal Secretions and the Ductless Glands*, 2d ed., 1922.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That Henry James had a greater knowledge and appreciation of various types of character than had William James.
2. Have professional psychologists overtaken Shakespeare's knowledge of human nature? What is meant by calling such knowledge as Shakespeare's intuitive?
3. "God forbid that any man should spend his days thinking about his own character." (Woodrow Wilson.) Explain this statement. To what extent do you approve of the view it expresses?
4. What is the meaning of conation? The term is derived from the Latin *conor*, undertake (related to the Sanskrit *khana*, dare). Are the lower animals known to us in their endeavors, or in their intellect?
5. Show (a) that the reason, the attention, and the memory of man are purposive, and (b) that the conation is related to the emotions (anger, fear, etc.) and to the sentiments (love, hatred, etc.).
6. Write an analysis of *Faust*, *Hamlet*, or *André Cornélis*, laying emphasis on the intensity and persistence of purpose displayed by the hero.

XXVII

THE SINCERITY OF THE MODERN DRAMA

In an interesting book, *The Legacy of Greece*, published six or seven years ago at Oxford by a number of British scholars, there occurs a criticism of one of the features of contemporary literature. Dr. R. W. Livingstone, editor and contributor, expresses the view that Shaw, Galsworthy, and others, are "parsons manqués, who were designed by nature to write not plays or novels but sermons. Or rather they are dual personalities; clergyman and creative writer have been combined in them and the clergyman has corrupted the poet. The unsatisfied appetite for preaching which a hundred years ago would have been quieted by writing an evangelical tract, today issues in a novel or a play." The great Greek writers by virtue, according to him, of a sense which is more esthetic than moral felt awe and wonder and not sheer disgust and distress at the agonies human beings must suffer. The Greeks were fascinated by the spectacle of the life of man, which it was the function of the poets to contemplate and reproduce without indulging in sentiment or rhetoric. Opposed to this attitude of esthetic detachment, we are told, is the modern habit of didactic comment and emotional inflation. Hardy, for example, would be incapable of recounting some of the savage incidents in the *Iliad* and the *Odyssey* without entering a protest against the cruelty of life. Livingstone is inclined to ascribe the moralizing and didactic strain in English literature to Puritan influence, while one of his collaborators associates it with the rise of modern industrialism. Other scholars, however, undertake to trace among the Greeks themselves the growth of the ethical and humanitarian spirit, which expressed itself in the recognition of the rights of women, in the

condemnation of slavery, and in the magnanimous treatment of aliens. This spirit, not wholly lacking in Homer — in spite of his evident delight in gluttony and bloodshed — and other early poets, is in a large measure present in the Greek drama of the Periclean age. Indeed, the greatest of the Greek dramatists were not guiltless of didacticism. Like the Hebrew prophets they made their ethical insight tell on the social life of their times. The evidence of this is abundant and decisive. Suffice it here to mention the realism and irony of Euripides,¹ the hostility to whose social and political views was comparable in fierceness with the opposition to Ibsen, Shaw, and other recent writers. Is not the modern drama following the lead of the Athenian in seeking to establish harmony between man's esthetic and ethical ideals?

Ibsen's *Hedda Gabler* warns us against the danger of inconsistency in the pursuit of the beautiful. The play depicts a young lady who, under the influence of an exaggerated and perverted estheticism, fails to apply her sense of beauty in some of the most important social situations. The first scene furnishes a retrospective sketch of her in girlhood as the attractive daughter of a military officer. Closer acquaintance reveals her as exquisite, fastidious, and grossly inconsiderate of the susceptibilities of others. Years before the beginning of the action portrayed in the drama she had been estranged from a brilliant admirer, who had offended her by his violence and who had later given way for a time to inebriety. Now at the age of twenty-nine she has allowed herself to be married to a commonplace man, whom she finds ridiculous and distasteful. He and his aunt, common and kindly like himself, eventually become insufferable in her eyes. Hedda's lover returns. She induces him to yield once more to his weakness for drink in order that she may see him free, godlike, and beautiful. When through her caprice he falls into irretrievable disgrace, she hopes that he may at least commit suicide beautifully. Even this desire for esthetic satisfaction is frustrated. Her conception of beauty is

¹ A thorough appreciation of Euripides — his social principles no less than his art — might incline us to admit the limitations of Shakespeare.

too inadequate to admit of realization, and she puts an end to her life to avoid what appears to her a more hideous fate. This modern drama, no less deadly to the illusions of romantic egoists than is the *Alcestis* of Euripides, is didactic and almost hortatory. It may be interpreted as a severe arraignment of contemporary manners and morals. As Ibsen and other modern dramatists maintain, there is no real contradiction between beauty and virtue, between the esthetic and the ethical ideal.

Stephen Leacock says that the old-fashioned play ends with marriage while the new-fashioned begins with it. The modern drama deals with love, marriage, and family life in the spirit of truth characteristic of scientific research, from which it draws its inspiration. For example, in *Arms and the Man* Bernard Shaw ridicules, in a way that to many seems insincere and almost sacrilegious, the sentimentalities of old-fashioned romance and the Byronic hero dear to the early part of the nineteenth century. In *Man and Superman* he playfully challenges the conventional assumption that all the responsibilities of courtship fall on the shoulders of one sex. In *Getting Married*, as in that play's remarkable preface, he discusses, with the restraint that so important a social question demands, the wisdom of our present marriage laws and customs. The complacency of the happily married, virtuous man is the topic of *Candida*. The precariousness of marital felicity is dealt with also in many other modern dramas, including Ibsen's *Nora* (*The Doll's House*), Benavente's *The Passion Flower* (*la Malquerida*), D'Annunzio's *la Gioconda*, Hervieu's *le Dédale*, Strindberg's *The Father*, Barrie's *The Twelve-pound Look*, and Synge's *The Shadow of the Glen*. In *The Madras House*, Granville Barker analyzes, along with other things, the claim to bliss and serenity of family life, even among the well-to-do and highly respectable. This list of plays, impressive in their criticism of popular idols, might be extended almost indefinitely. The opinion that the average home is a sanctuary, and an infallible school of all the virtues, is found to rest on nothing more substantial than limited and prejudiced observation. As Shaw says, however, all plays

which deal sincerely with humanity must wound the monstrous conceit which it is the business of romance to flatter. The slightest concession by the dramatist to the spirit of truth in the treatment of love, marriage, and family life may be hotly resented by critics well aware of the facts. From their point of view it is the function of the stage not to instruct, not to hold the mirror up to nature, but to soothe and to cajole the public after the *serious* business of the day is done.

Should prostitution and vice be represented in modern plays, those abstracts and brief chronicles of the time, and, if so, must the dramatist treat such subjects with sincerity and scientific truth, or must he rather, glossing over the more repellent features of immorality, distil from it what he can of romantic and sentimental charm? Many of the admirers of Shakespeare refuse to believe that he penned the scenes of sordid life in *Pericles*, though these scenes are undoubtedly in the style of the master dramatist and deal with a subject of great social significance, no less for his time than for our own. The number of comparatively recent writers of plays and novels who have touched upon prostitution and its consequences indicates that at the present stage of civilization this topic, however abhorrent, cannot be altogether ignored by the informed and conscientious literary artist. That the manner of treatment has varied, according to the purpose and temperament of the writer, a few examples will show. Granting that Dumas' *la Dame aux Camélias*, like Puccini's opera *la Bohème*, is not devoid of ethical purpose, and that in portraying the demi-monde of Paris it extends the range of human sympathy, we must recognize that it differs from a number of more recent plays dealing with vice as regards the austerity of the treatment and the nature of the emotions it seeks to evoke. One might say that the difference between it and Ibsen's *Ghosts* is analogous to that between Daudet's *Sapho*, the moral aim of which no careful reader will question, and Arnold Bennett's *Pretty Lady*. We owe to the influence of Ibsen, *The Second Mrs. Tanqueray* of Pinero, and Echegaray's *A Son of Don Juan*. In France the cosmopolitan Brioux, in whom the didactic

tendency is so marked that the critics fear that his art is endangered by his conscience, has put on the stage *Damaged Goods* (*les Avariés*), made accessible to English-speaking audiences through the influence of Shaw. The *Anna Christie* of Eugene O'Neil, the most talented of contemporary American playwrights, does not belong precisely to the same class as these dramas, but it should be mentioned here as a sincere treatment of vice and home conditions. Shaw's *Mrs. Warren's Profession* gives a scrupulously fair portrayal of one phase of prostitution, and undertakes to indicate the cause of the social malady it describes. Under present economic conditions social reformers feel that efforts to control the results of prostitution are as depressing as the task of pushing a huge stone up the side of a hill only to see it, when apparently near the summit, roll back to the old level.

In *Major Barbara*, Shaw puts forward the view that poverty is the greatest of evils and the worst of crimes, a view which appears to people of ample means a particularly repugnant paradox. At first glance this play might seem to lend support to the argument of Tennyson's *Northern Farmer* that the poor as a rule are bad. This argument assumes, however, that whenever work is done the worker secures the benefit; and, moreover, it is inclined to identify the wealthy with the industrious, in spite of the frequent connection between the accumulation of wealth on the one hand and luck, dishonesty, and violence on the other. From Shaw's point of view poverty is an evil which must be treated drastically because it is prolific of so many other evils. In so far as it is not the result of shiftlessness, the responsibility for it must fall on the organization of the industrial and economic life of the commonwealth. In *Major Barbara*, as in Gorky's *At the Bottom* (*Na dnye*), it is made clear that truth, honor, and the other virtues are not for the very poor. Money alone in the complex conditions of contemporary civilization can provide the freedom and power necessary for development. "Poverty blights whole cities; spreads horrible pestilences; strikes dead the very souls of all who come within sight, sound or smell of it. What you call crime is nothing: a murder here

and a theft there, a blow now and a curse then: what do they matter? they are only the accidents and illnesses of life; there are not fifty genuine professional criminals in London. But there are millions of poor people, abject people, dirty people, ill fed, ill clothed people. They poison us morally and physically: they kill the happiness of society: they force us to do away with our liberties and to organize unnatural cruelties for fear they should rise against us and drag us down into their abyss." In *Czar Hunger* Andreyev prophesies the avenging wrath of the proletariat. In *The Good Hope* Heijermans voices the distress of the Dutch fisherfolk. In *The Weavers* Hauptmann has given expression to his compassion for the misery of the linen-weavers of his native Silesia held in a pitiless industrial subjection; while in *Honor* Sudermann describes the degenerate poor of Berlin. As by the Athenian Aristophanes, so by the dramatists of today it is recognized that the unequal distribution of wealth brings evil consequences to the various strata of society.

In *Augustus Does His Bit*, in which a scion of the British nobility is represented as jeopardizing the national interests by his incompetence, Shaw ridicules the pretensions of the so-called directing classes. In more serious style Galsworthy in *The Skin Game* portrays the antagonism between the old landed proprietors of England and the *nouveaux riches* raised to power through the development of modern industry. The conflict between the Hillcrist, the representatives of tradition and culture, and the Hornblowers, the representatives of enterprise and recent success, is more than local in its interest. How remain faithful to the ancient ideals of courtesy and magnanimity in the face of mean aggression, or how remain true to the principle that nobility of character entails obligation rather than privilege? In the case depicted by Galsworthy the gentry fall short of their own professed standards, and adopt Hornblower tactics. "When we began this fight," says Hillcrist, "we had clean hands . . . are they clean now? What's gentility worth if it can't stand fire?" In *Loyalties* Galsworthy records a more severe judgment of a section of the English privileged

classes. In a clear case of right and wrong, loyalty to ethical principle wavers in the balance when loyalty to the social set, or *grex*, is in the opposite scale. Racial prejudice and trifling considerations of good form are allowed to pervert the sense of justice. Only when a lawyer's professional etiquette, falsely called loyalty to the law, is thrown into the scale against loyalty to the social clique, is there an approximation to fair play.

The Cherry Orchard of Tchekhov is more akin to Shaw's *Heartbreak House* than to *The Skin Game* and *Major Barbara*. It is true that the Russian dramatist described the decadence of the landed proprietors and the rise to wealth and power of the enterprising plebeians. Moreover, Tchekhov recognized the wretchedness of the masses of the Russian people under the Czarist régime, living like savages, eating like beasts, infested with vermin, sleeping in filthy conditions, and exposed to every form of moral degradation. As regards the evils of poverty he thus supported the evidence of Gorky, Shaw, Hauptmann, Sudermann, and all the dramatists who have eyes to see and inclination to record their observations. Tchekhov believed that in the course of a few centuries the world might be transformed. As one of the characters in *The Cherry Orchard* says: "Mankind marches forward perfecting its strength. Everything that is unattainable for us now will one day be near and clear; but we must work; we must help with all our force those who seek the truth. At present only a few men work in Russia. The vast majority of the educated people that I know seek after nothing, do nothing, and are as yet incapable of work." The educated people described by Tchekhov are like those of *Heartbreak House*, nice but futile, interested in dilettante fashion in literature, music, and the other arts, and possibly in the progress of science, but lacking in foresight and purpose. *Heartbreak House*, according to Shaw, represents cultured and leisured Europe before the war. Power and culture are in separate compartments. Opposed to the cultured and comparatively enlightened stands the sporting leisure class, disdainful of learning and intellect but singularly tenacious of political place and influence. The control of government falls

now into the hands of amateur statesmen, for whom war is a spectacle or the sacrifice of a hundred thousand men a fair gamble, now into the hands of parliamentarians skilled in academic rhetoric and dialectic, or, again, into the hands of astute politicians, whose measures are dictated by the gusts of popular sentiment or by the desires of the privileged classes.

Capek's *R. U. R. (Rossum's Universal Robots)*, the Bohemian satire on the mechanizing and standardizing tendency of modern industrial civilization, is of no less significance for America than for Europe. That Frankenstein monster, the universal robot, is partly the result of prolonged and ingenious efforts to manufacture in maximum quantity and at minimum cost. It is assumed that the best sort of worker is the cheapest, the one with the fewest requirements, stripped of everything that does not contribute directly to the progress of work, *efficient*, simple, sexless, without an interest in life or death — in short a machine to be bought and sold rather than a man or woman. In the robot mill described by Capek a visitor has difficulty in distinguishing the managers from the output. The former talk of nothing but their work, all day, every day; their greetings are perfunctory, and their gestures stereotyped. At a performance of Capek's play in one of the American cities a professor of the local university found it highly ludicrous that the mob of stage automata — cut to the one pattern and formidable in the mass — should have been recruited from his own classroom, though he was prepared to admit that the evil effects of mass methods and standardization are not confined to the industries.

REFERENCES — Archer, W.: *Playmaking*, 1912; Clark, B. H.: *A Study of the Modern Drama*, 1925; Ervine, St. J.: *Some Impressions of my Elders*, 1923; Grein, J. T.: *The Theater and the World*, 1921; Matthews, B.: *Playwrights on Playmaking*, 1923; Lewisohn, L.: *The Drama and the Stage*, 1923; Phelps, W. L.: *Essays on Modern Dramatists*, 1920-1921; Stanislavsky, C.: *My Life in Art* (translation by J. J. Robbins, 1924); Waxman, S. M.: *Antoine and the Théâtre-Libre*, 1926; Yeats, W. B.: *Plays and Controversies*, 1924.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the best known playwrights of the twentieth century have as a rule shown an interest in social reform.
2. "Since it is the duty of comedy to set men right while amusing them, I thought that in my calling I had nothing better to do than to attack by means of ridicule the shortcomings of the age." (Molière.) Compare this opinion of the function of the stage with that of recent playwrights.
3. Compare the plays of Shaw with those of Shakespeare as regards (a) artistic quality, and (b) the obviousness of the central ideas.
4. Analyze Ibsen's *An Enemy of the People*, or *The Pillars of Society*, and explain its social significance.
5. (a) Compare modern fiction with modern drama as reflecting the civilization of our times. (b) Who will be considered a hundred years hence the representative American prose writers of the first part of the twentieth century? Discuss.
6. In what sense does Shaw's *Heartbreak House* represent cultured and leisured England before the Great War? Compare it in its political bearing with *The Cherry Orchard* of Tchekhov.
7. Discuss Capek's *R. U. R.* in the light of the claims of capitalism set forth at the close of chap. xx.

XXVIII

THE NATURE OF THE FINE ARTS

'Tis to create, and in creating live
A being more intense that we endow
With form our fancy, gaining as we give
The life we image, even as I do now.
What am I? Nothing: but not so art thou,
Soul of my thought! with whom I traverse earth,
Invisible but gazing, as I glow
Mix'd with thy spirit, blended with thy birth,
And feeling still with thee in my crush'd feelings' dearth.

— *Childe Harold's Pilgrimage*

From the standpoint of creative genius art is, as Byron indicates, the reconstruction of experience in favor of a subjective satisfaction. In a great many cases, to say the least, the artist's design is to gratify an emotional need, to give expression to a mood, to preserve and to enhance his delight in fleeting sensory impressions, and, by force of imagination, to escape from the thralldom of circumstances. The highest art is not for the complacent conservative, though the artist may criticize the present by the standards of an imaginary past. It is a protest against things as they are, and implies antagonism between the actual and the ideal. It may, as we have seen in the preceding chapter, further — as do the sciences, the industries, and productivity in general — the progressive tendencies of the times. In general, to hold the balance between the dream and the reality, to glance from earth to heaven and from heaven to earth, to pay homage both to the concrete and the abstract, to reconcile intuition and conception, and thus give play to the emotions and furnish an immediate and renewable satisfaction, are the characteristic functions of art.

A careful comparison of Shakespeare's *Julius Cæsar* with the parts of North's translation of Plutarch from which the poet drew his historical data would show precisely how the raw material was selected, combined, and modified, in order to produce the finished work of art. Even a brief examination of the play with reference to its historical setting affords us a valuable clue to the nature of dramatic art. To fix on the death of the altruistic Brutus and the victory of an egoistic imperialism as the culmination of the tragedy was, no doubt, a fundamental decision on the part of Shakespeare. The choice for dramatic treatment of certain occurrences would seem to follow inevitably — the triumph of Cæsar over Pompey's sons as the turning point in his popularity, the Lupercalian games, the meeting of the conspirators, the assassination, the funeral, the formation of the triumvirate, the quarrel of Brutus and Cassius, the appearance of Cæsar's ghost, and the final struggle and catastrophe. The more closely we examine the text of the drama, however, the more we become aware of the alchemy that transmutes prose into poetry, of the skill exercised in the manipulation of incidents and details, and of the conscious planning of the artist; for, as Croce declares, it is a mistake to assume that unconsciousness is the chief quality of artistic genius. Note, for example, the care with which Shakespeare suggests the succession of morning, afternoon, and evening in the three scenes of the first act, and the ingenuity with which he imparts a semblance of close continuity to the events of the whole drama, which historically covered a period of more than three years. Observe the devices by which the dramatist increases the feeling of suspense and apprehension, particularly throughout the four scenes of the second act. A great deal of evidence might be brought forward to prove not only that Shakespeare was fully conscious of the artifices by which he controlled the emotions of the audience but that he even resorted to *intentional ambiguity* in order to secure his effects. For example, it is impossible to decide whether the third scene of the first act, which begins with the meeting of Cicero and Casca in the midst of a thunderstorm, represents the close of the feast of Lupercal,

February 15, or the evening of March 14, when the assassination of Cæsar was imminent. Under the spell of the artist, the auditor or the casual reader accepts it as representing either or both. Again, in the fifth act Shakespeare has deliberately telescoped the two battles fought at Philippi, between which in reality there occurred an interval of about three weeks. After lamenting the death of Cassius, Brutus says:

'Tis three o'clock; and, Romans, yet ere night
We shall try fortune in a second fight.

The artistic advantage of this deviation from historical truth might seem necessarily to involve the disadvantage of representing Cassius as dying in the middle of the day. Earlier in the same scene, however, the poet makes Titinius exclaim over the body of Cassius:

O setting sun,
As in thy red rays thou dost sink to night,
So in his red blood Cassius' day is set,
The sun of Rome is set!

Thus by a touch of artistic legerdemain the dramatist gives an illusion of declining day, without contradicting the assumption that Cassius died long before evening. One of the commentators has proposed to insert a hyphen between "to" and "night" in the interests of clearness, oblivious of the fact that obscurity of style may be a virtue in poetry.¹

¹ When Napoleon asked Goethe why in one of his works he had written something that was demonstrably untrue, the poet replied that an artist might be pardoned for making use of an artifice not easily to be discovered in order to produce certain effects. Compare with this statement of the poet the lines in *Faust*:

In bunten Bildern wenig Klarheit,
Viel Irrtum und ein Fünkchen Wahrheit,
So wird der beste Trank gebraut,
Der alle Welt erquickt und auferbaut.

Note also The Author's Apology prefacing *The Pilgrim's Progress*, especially, among other ingenious lines defending the obscurity of his literary style:

"Dark clouds bring waters, when the bright bring none."

In a similar spirit Tolstoy, the great iconoclast of literary criticism, who spoke very disparagingly of the art of the four greatest Greek dramatists, of Dante, Shakespeare, Milton, Ibsen, and other famous writers, complained of the *wilful obscurity* of modern verse. The symbolists, as he observed, had the hardihood to preach what they practised, and to set forth in verse and in prose the praises of haziness, obscurity, and ambiguity. He cited a couplet from Verlaine which glorifies the combination in poetry of the vague and the precise:

Nothing more fine than a chanterey tipsy,
A bride demure and a groom half gypsy.

In the judgment of Mallarmé poetry should always be enigmatical. He believed with Macaulay that the essence of artistic charm lies in allusion. Esthetic satisfaction depends on the reader's response to suggestion, on creative (or recreative) interpretation. Tolstoy, though he remained absolutely unshaken in his hostility to the cult of the obscure, was fully aware that it was not confined to the writers of any one school or nation. He admitted that the poets of all European countries thought and acted in the same way. So also, he complained, did recent artists in all branches of art, from the most complex to the simplest — poetry, music, painting, sculpture, and architecture. They appealed, according to Tolstoy, only to the initiated, and did not think it necessary to make themselves intelligible to the masses of the people.

The theory and practice Tolstoy condemned is not confined to Europe or to recent times. Japanese lyrics, we are told, depend largely for their effects on subtle and intricate double meanings, frequently too involved to admit of logical explanation. Translations can give no adequate idea of their delicate suggestiveness:

Butterflies in the meadow!
I wonder where he's chasing them today.

.

On the pink-flower there is a white butterfly;
Whose psyche, I ask me.

Even while praying together in front of the tablets ancestral,
Lovers find chance to murmur prayers never meant for the dead.

Dr. A. J. Bell, professor of comparative philology in the University of Toronto, has recently shown to how great an extent Virgil, Horace, and other poets of antiquity sacrifice clearness of style, characteristic of prose, to the exigencies of poetic art. In prose diction every word is supposed to convey a clear and distinct meaning; while in poetic diction exactness of denotation yields to richness of connotation. It is obvious that metonymy, synecdoche, hendiadys, zeugma, ellipsis, and other types of figurative language familiar to the student of classical poetry, serve to stimulate the imagination rather than to satisfy the reason. To confuse the species with the genus and the effect with the cause, to substitute one term for another, to express a pair of things by one term or a single thing by two coördinate terms, to apply to terms inconsistent or ambiguous predicates or modifiers, to leave gaps in the discourse to be filled at the caprice of the reader, and other similar rhetorical devices — since they fly in the face of logic — must have some other end than clearness and precision of style. In Professor Bell's pages we find that what Ruskin taught in *Open Sesame* concerning Milton and other English classics holds likewise true of the Greek and Latin poets, namely, that they conceal rather than reveal their thoughts, and that the exercise of considerable ingenuity is required in their interpretation. This apparent reticence on the part of the great poets is neither the result of perversity nor, as Tolstoy would have us believe, of class consciousness, but springs from the desire to convey moods and sentiments rather than to express definite concepts and logical propositions. Holding the intellect in check, they give rein to the feelings. To apply the term *Sidonian* to the wealth of Carthage, to adorn Pollux with the attributes of Castor, to picture the new moon as

rising, or seeming to rise, in the west, are the touches that add charm to epic literature.² The use of digressions and episodes, and the variety and confusion of the associations increase the intensity of the emotional response.

A similar concession to the play of the feelings may be found in painting and other arts less complex than poetry. Let us suppose that an artist is rambling through the fields on a fine October day. He has left his easel and brushes at home. Suddenly he is exhilarated in the presence of nature — “struck in the heart,” to use his own vivid expression. On consideration he realizes that the essence of his satisfaction is a color combination, a stretch of blue water seen against a background of yellow sand and old-gold foliage. Masses of amber clouds, observed above the trees, do not detract from the esthetic effect. Further observation reveals another pond about a mile to the right, too distant to come within the picture which the artist in his imagination has already begun to paint. He chops out a bit of the landscape, moves up the additional stretch of blue, and thus enhances the original color stimulation and improves the pattern of the scene, that is, the distribution of the masses of color. After further modifications — unconscious, no doubt, as well as conscious — the picture is ultimately put on canvas. The amber clouds are rearranged and thinned out, so that they may not enter into rivalry with the initial intuition or convey the impression of too somber a mood. Certain attractive purple flowers in the foreground are suppressed as detrimental to the total effect, and the corresponding part of the canvas is curtailed. In short, the artist endeavors to express his feelings and to impart to others an appreciation of his sensuous impressions.

Music is the freest of the arts in the sense that it leaves the play of the imagination comparatively untrammelled by conceptual thought. One of the ancient writers held that, since it was irra-

² Dr. George Sarton has recently stated that epics are the primitive form of history, and that as soon as they cease to be considered true histories by the people who produce them, they cease to be true epics. If this view be accepted, the famous works of Tasso, Ariosto, and Camoëns must be excluded from the list of true epics. As histories of the events and periods they treat of, they are simply ludicrous.

tional, it could have but little effect on the human soul. The philosophers who opposed this view in antiquity did not claim that music was rational or intellectual, but insisted that it exerted an important influence on the character through the feelings. In modern times this teaching has been supported by some of the greatest philosophers and artists. For them the noblest music re-echoes the eternal rhythms of nature and serves to establish a rapport between the universal harmonies and the emotional life of man. In the judgment of recent psychologists, not in the least inclined to mysticism, rhythm and music have a far-reaching effect on what is most fundamental in human consciousness. The musical composer is concerned with the conveyance of moods and sentiments and is under no obligation to describe or imitate the sights and sounds of nature. The occasional mimicry in music of the song of the cuckoo, dove, or nightingale, or the bleating of sheep, may be justly regarded as exceptional. As a rule, attempts to interpret instrumental music in terms of specific action and definite scenery cannot meet with success. Only in so far as the interpreter contents himself with describing his emotional response is he likely to find common ground with the composer. Even when the creative artist has been directly under the influence of an idea, the chance of its being precisely interpreted is very remote. Music in the early history of the art was wholly emotional, and it is still predominantly so. Within the last two centuries, as is well known, Haydn, Mozart, Beethoven, Schumann, Wagner, and others have endeavored to break through the old limitations of musical production. Wagner's use of the *leitmotiv*, for example, was a heroic attempt to increase the intellectual content of music. In spite, however, of this modern tendency to introduce a rational element into the composition of music, interpretation in this art, even more than in painting and poetry, depends on the feelings and imagination of those to whom the artist makes his appeal.

Architecture resembles music as regards the fundamental nature of its emotional effect and its freedom, in the main, from the need of imitation; it differs from music as regards the dominance of

utilitarian and material requirements. As a fine art, according to Sir Sidney Colvin, its function is to express and transmit emotion by certain characteristic means. A Gothic cathedral, for example, conveys a sense of the infinite by its colossal proportions, by its stability, and by the equipoise of its stationary masses. Here the material, in spite of bulk and solidity, is subjected to the immaterial. The direction of its contours, the upward tendency of its dominant lines, the lightness and boldness of its flying buttresses, contribute to the feeling of sublimity. The distribution of light and shade, the delicate tracery of religious symbols, the sculptured grotesques, the effigies of saints and emperors, kings and local dignitaries, the minor ornaments replete with associations of the humblest callings, the elaboration and complexity of the interior, reflect the spirit of an age of childlike faith and devotion touched with feelings of spiritual ecstasy. The aisles and columns and arched roof are to the susceptible reminiscent of the sacred groves of antiquity pervaded by the *horror sacer* of untold ages of human sacrifice. The emotional tone of the worshiper is heightened or otherwise modified by the consciousness of the crypt, the tombs with their heraldic devices, the noble and pious dead, the storied windows, the vestal flame, the dim vistas, the hidden sanctuaries, the holy vessels and vestments, and the numerous emblems of divine compassion. How different from the spirit of the thirteenth century is that expressed by Greek temple architecture and by Greek sculpture!

Sculpture conveys emotion by the imaginative representation of natural objects. Associated among the early Egyptians and Greeks with funerary rites, this art has as its paramount subject the idealized human form. Here the spirit is transcendent. For the Greeks the most adequate conception of deity was man or woman transfigured by the creative imagination. Theirs was a religion of manlike gods and godlike men. Even Zeus, the supreme god, had human attributes; nor could the Greek artists picture any being in Hades, Olympus, or the wide heavens more essentially divine than their fellow creatures.

REFERENCES — Bell, A. J.: *The Latin Dual and Poetic Diction*, 1923; Bosanquet, B.: *A History of Aesthetic*, 1904; Colvin, S. (Sir): "Fine Arts," *Ency. Brit.*, 1911; Croce, B.: *Aesthetics as Science of Expression* (translation by D. Ainslie, 1909); Gordon, Kate: *Esthetics*, 1909; Hearn, L.: *Japanese Lyrics*, 1894; Hirn, Y.: *The Origin of Art*, 1900; Knight, W.: *The Philosophy of the Beautiful*, 1891-1893; Page, C. H.: *A History of Japanese Poetry*, 1923; Puffer, E. D. (now Mrs. Howes): *The Psychology of Beauty*, 1905; Tolstoy, L. N. (Count): *What is Art?* (translation by A. Maude, 1899).

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That the majority of distinguished modern poets are, as regards their literary style, consciously and wilfully obscure.
2. Discuss the theory that the chief function of the fine arts is to give play to the feelings, and that this holds true both in artistic creation and in artistic appreciation.
3. Write an essay of three or four thousand words on "Play and Amusements," discussing their significance for the development of the individual and for the advancement of society.
4. Make a careful analysis of Goethe's *Erkönig*, showing how its effect on the imagination and the feelings is obtained.
5. Examine Tennyson's *The Holy Grail*, lines 504-532, and point out the devices by which the poet, without renouncing reason, succeeds in making Percivale's account of his vision of the Grail in some sense plausible.
6. Have the great poets considered that literary masterpieces are in need of explanation? Illustrate by reference to Coleridge's interpretation of *The Ancient Mariner*, to Dante's interpretation of *The Divine Comedy*, or to Goethe's interpretation of *Hamlet*.
7. How would you explain the artistic effect of Millet's *Angelus*? Do you consider the landscape subordinate to the figures? Is the picture as effective in black and white as in colors?
8. Discuss the opinion that modern music as a rule leaves the play of the imagination untrammelled by conceptual thought.

XXIX

PHASES OF RELIGION

The theological conceptions of the Greeks, reflected in their poetry no less than in their architecture and sculpture and definitely formulated in their philosophy, can be explained only from the genetic point of view. Greek religion was the first clearly to recognize in man the highest of natural beings, far removed from all lower forms and closely akin to deity. The subordination of nature to man, the conscious supremacy of man over all other visible things, animate and inanimate, implied freedom from the bonds of superstition and from other inhibitions of thought and action. At an early stage in the development of Greek religion there were ascribed to the gods human forms, personalities, virtues, and frailties. In theology, as in other realms of thought, man was the measure of all things, and deity was made in his image. In the judgment of the Scottish philosopher Edward Caird, Greek religion was characteristically anthropomorphic. The gods and goddesses of Olympus did not disdain to mingle their being with that of the sons and daughters of men. The gods were the progenitors of mortal offspring, and heroes and rulers won for themselves a place among the immortals. Deities such as Poseidon and the Homeric Helios were little more than personifications of natural phenomena; while Apollo, the god of beauty, music, and prophecy, and Athena, goddess of wisdom, in whose honor the Temple of the Virgin adorned the Acropolis, represented the arts and ideals of an advanced civilization. The Greek gods might be deposed or transformed. Other celestial monarchs had reigned before Zeus. Even in the Homeric age divinity was no longer considered wholly objective; the gods might assume the form and guise of individual men, and remain

hidden from the eyes of some persons, "for the gods in no wise appear visibly to all." Before the end of the sixth century B.C., more than one Greek philosopher protested in the interests of morality against certain accounts of the gods in epic literature, and maintained that there is only one divine being and that he is comparable neither to the gods described by the early poets nor to men. For Plato, deity is above all the idea of the good. Among the Greek dramatists there may be traced a progressive refinement of theological teaching. Indeed, as Caird asserts, it is only by appealing to the principle of development that the inconsistencies of the religious doctrines of the Greeks can be reduced to harmony.

This principle has also been employed in the study of the more advanced religions, such as Christianity and Judaism. For example, the great Christian mystic Newman, who in defense of religion erected a bulwark against the inroads of nineteenth century materialism, held that pagan literature, philosophy, and mythology — rightly understood — had paved the way for the acceptance of the gospel, and that the Greek poets and sages were in a sense prophets. On the eve of his withdrawal from the Anglican ministry he showed that the variations in the doctrines of the Catholic Church, which had previously been the subject of his hostile criticism, could be explained on the principle of development. A like explanation is generally accepted of the relation of Christian to Jewish religious teaching. According to a great many Christian writers, the former is an outgrowth or development of the latter. Jesus came not to abrogate the Mosaic law, but to develop it. The late Professor Drum recognized a number of stages in the growth of revealed religion among the Jews before the advent of Christianity. Lyman Abbott wrote specifically: "Moses' conception of God is superior to that of Abraham, David's is superior to that of Moses, Isaiah's is superior to that of David, and Paul's is superior to that of Isaiah." Since the religion of the Greeks underwent a series of progressive changes from the time of Homer till that of Euripides and Plato, since Judaism continued to develop

from the dawn of history till the beginning of the Christian era, and since Christian doctrine, which sprang from Judaism and was not uninfluenced by the religious conceptions of the Greeks, has varied from age to age with the advance of civilization, we are naturally led to inquire concerning the development of religion in general. What was the origin of this almost universal social phenomenon? What are its chief characteristics? Does the advance of civilization involve a spiritual progress, walking hand in hand with ethical and no less important than intellectual and economic progress? Are there any clear indications as to the direction of religious development?

Among the numerous theories of the origin of religion may be selected those which lay special emphasis on one of the four following elements: animism, naturalism, magic, and totemism. Man at one of the stages of his development makes no clear distinction between the animate and the inanimate. All things seem to him sentient and imbued with spirit. He may attach a superstitious significance to any natural object that gives play to his imagination, and to which he may impute feelings akin to his own. Clouds, mist, rainbow, wind, sky, moon, sun, stars, springs, rivers, trees, and mountains may become the objects of his worship. In dreams his own spirit communes with the spirits of nature and with the spirits of the dead, the shades of his forefathers, and the ghosts of his enemies, which must be propitiated and placated. As a recent writer remarks, the death basis of religion is so old, so deep, and so general that we must look for its cause in our very beginnings. "What was the principal crisis in the life of primitive man? His activities were hunting and fighting. After long, patient hours of tracking or lying in wait, after fierce struggle with his enemy, beast or man, came the climax — death. Death was the event, the purpose of his efforts, the success, the glory. If he was the dead one, we cannot follow further; but if he triumphed and saw his 'kill' before him, here was cause for thought. This creature which had fled swiftly or struggled violently had now stopped. It didn't go any more. The body was there as before, but something had

gone from it. What was it? Where had it gone? " After the victory came the feast, perhaps the cannibalistic orgies of the savages. They gorged themselves to repletion. In their dreams their victims lived again, larger and more formidable. Perhaps in the dream the fight came to a different end, and the dreamer fancied himself wandering in the shadowy realms of the spirit world. In contrast with the animistic theory, the naturalistic theory bases the evolution of religion on actual rather than on illusory experience, though it does not fail to take account of the part played by the imagination. Its exponents hold that the gods of primitive religion are personifications of certain natural phenomena — fire, the bright sky, and the earth-shaking sea. A third theory maintains that religion arose through the attempts of primitive man — practical and utilitarian rather than speculative — to control nature by means of magic. Failing in this he resorted to persuasion, adding entreaties and incantations to his earlier procedure. According to the collectivist theory of the origin of religion, its earliest form was devotion to the clan as represented by the totem. The totem, usually a species or variety of animal or plant, is the group name and the emblem of its solidarity and will. Through the symbol the clan is personified and worshiped as a god.

It has been indicated by the investigations of Durkheim and others that religion is preëminently a social phenomenon. The close relation between religion and morality, the religious significance of the social rebirth mentioned in an earlier chapter, the fact that a heightened sense of brotherhood and a renewed consecration to the supreme spiritual principles are associated with movements toward both religious and social improvement, incline us to welcome the conclusions drawn from these studies. No formula for religion is acceptable that fails to recognize the importance of the social element. Man, freed from the limitations of his own individuality by social contacts and aided by language, the means of social communication, is able to conceive the ideal as the complement of the real. The mental powers are raised to a higher plane in company than in solitude, as the original Fellows

of the Royal Society maintained with special reference to the intellect. But bodily presence is not essential to the effectiveness of social stimulation. Even in apparent solitude the religious or social reformer may be compassed about by a great cloud of witnesses — representatives of the past and the present whose ideals he has assimilated as well as representatives of the future whose nature and needs he by the magic of imagination is able to anticipate. Both religion and social enthusiasm cherish the dream of “a perfect society, where justice and truth would be sovereign, and from which evil in all its forms would be banished forever.”

As a recent Catholic writer asserts, there is no such thing as standing still in religion; we must either develop or degenerate. Spiritual progress has its intellectual as well as its emotional and volitional aspects. The whole nature of man is involved. We must distrust a belief that is subversive of charity, or that does not incite us to act in harmony with our most enlightened thoughts and feelings. The great discoveries of modern times, the development of astronomy, geology, biology, anthropology, history, philology, comparative religion, and other branches of study, have modified the attitude of men in all highly civilized countries toward the formulation of religious truth. Long since, it was recognized by all that the discoveries of Columbus, Copernicus, Galileo, Newton, and Lyell were not detrimental to the interests of true religion. In due time a similar recognition will be extended to the more recent discoveries. The advance of scholarship is now so rapid that only particularly gifted minds are able to keep pace with the new and at the same time retain all that is vital in the old. Moreover, in the actual organization of society it is only the exceptional person who has the necessary education, or who feels that he has the necessary leisure, to warrant an independent judgment concerning religious problems. Under the circumstances a great many people naturally consider that the wisest thing to do is to accept the decision of their leaders on controversial matters. Consequently, the confidence of the Christian public in the character, training, and ability of the clergy, or of lay scholars, has a great deal to do with

the acceptance or rejection of such teachings as the immortality of the soul, the personality of God, the deity of Jesus, the virgin birth, the resurrection of the body, the credibility of miracles, the creation of man from the dust of the ground, the creation of woman from one of his ribs, and the verbal inspiration of the Old Testament and the New.

There are indications that the religious institutions of the civilized world are growing, and will continue to grow, more sympathetic with the pursuit of truth and the diffusion of knowledge. Some of the cruder forms of persecution have been abandoned. The panic that arose among Christian Churchmen at Oxford and elsewhere, in consequence of the geological discoveries at the close of the eighteenth century and in the early part of the nineteenth, has been in part allayed. Some of the great religious organizations already regard with a certain degree of tolerance and equanimity the discoveries of modern biology. "To be scientifically minded," says one Christian leader, "is one of the supreme achievements of mankind. To love truth, as science loves it, to seek truth tirelessly, as science seeks it, to reveal the latent resources of the universe in hope men will use them for good and not for evil, as science does, is one of the chief glories of our race." That being the case, it is reasonable to expect that the Christian Church of the future will be true to its nobler traditions as an active promoter of learning. Mere abstinence from persecution, or a lukewarm tolerance of science, will no longer suffice. We must insist, as did Gautama, on the necessity of diligence in the pursuit of truth. There is no causal relationship between piety and gullibility. Every religious person is under moral obligation to aid science in the extirpation of ignorance and superstition with all their progeny. Not the least culpable form of skepticism today is lack of knowledge of the means whereby the misery of the world may be relieved and lack of faith in the purposes of those who have developed or stand ready to apply them. The world's accumulation of organized common sense represents the devotion of the greatest benefactors of the race. The last vestige of the medieval belief that the devotees

of science are in league with the sinister forces of the universe and that certain branches of learning are the strongholds of satanic influence must be replaced in the minds of religious people by a just appreciation not only of the labors but also of the motives and characters of those who have contributed to the development of science and thus made modern civilization possible. It must be counted an offense against the spirit of progress to ignore either the work or the personality of such men as Sydenham, Dalton, Faraday, Pasteur, Lister, and Darwin.

A Cambridge scholar has recently expressed the opinion that women will begin before long to take a more definite part in the development of religious knowledge, though he thinks it wise to refrain from attempting to forecast the result. It is, therefore, of particular interest to glance at Mrs. Gilman's piquant comparison of the religions of the past with the religion of the future. According to this writer, what man's religion has done *to* the world stands in glaring contrast with what woman's religion will do *for* the world. The great function of woman since the beginning of the history of the species has been to give life, not to take it; the supreme crisis of her conscious experience has been birth, not death. Her master motive has been love, not fear or anger. Her allotted portion has been constructive work, not war and the chase. Consequently her essential religion is of the here and now, rather than of the hereafter; it is concerned with present duty and behavior, not with speculation as to what may befall us after we are dead. It prefers an immediate altruism to a posthumous egoism. The happy hunting grounds, Valhalla, and the recrudescence of ghost worship (with the angels of Mons) are not the products of her imagination. Today women are more and more conscious of the immortality of the species. The improvement of the race, not wholly neglected by Judaism, Christianity, and other great religions of the past, must now be considered the most important of all duties. Honor is to the child no less than to the parents. Indeed, posterity rather than ancestry is the object of woman's reverence and devotion. When religious organizations concentrate attention

on life and the improvement of life, no rational being will be deaf to their appeal. With their help "we can outgrow such disgraceful diseases as war and poverty; we shall blush at the memory of intemperance and prostitution; our children will grow up in the assured hope of a better world of their own making and of the daily glory of making it."

The widespread movement toward church union both in Europe and America, if carried through in the right spirit and under the right auspices, must increase the power of institutional religion to advance the welfare of mankind at large. The recent union of Canadian Methodists, Congregationalists, and Presbyterians, to form the United Church of Canada, is an experiment of more than local or national importance. It has been hailed almost universally as a prophecy of what is to take place in other parts of the civilized world, and as a recognition of the freedom and authority (above all other authorities) of the truth. It has been acclaimed as an enlightened effort to escape from sectarian narrowness, to forget historic differences for the sake of the end in view, and to face the future rather than the past. The Presbyterian non-concurrents condemn the union as abandoning revered traditions and vital beliefs for the rationalism of the modernist and as sacrificing the autonomy of their church in the interests of an ecclesiastical merger. However, in this as in any similar experiment, the success of the larger organization will be judged by its ability to meet the spiritual needs of all the people without surrendering to the domination of any one class.

REFERENCES — Abbott, L.: *The Evolution of Christianity*, 1926; Caird, E.: *The Evolution of Religion*, 1893; Drum, W.: "Religion," *Ency. Am.*, 1925; Durkheim, E.: *The Elementary Forms of Religious Life* (translation by J. W. Swain, 1912); Fosdick, H. E.: *Christianity and Progress*, 1922; Gilman, Charlotte P.: *His Religion and Hers*, 1923; Hopkins, E. W.: *Origin and Evolution of Religion*, 1923; Mathews, S.: *The Faith of Modernism*, 1924; Newman, J. H. (later, Cardinal): *Essay on the Development of Christian Doctrine*, 1843; Simpson, J. Y.: *Landmarks in the Struggle between Science and Religion*, 1925; Widgery, A. G.: *A Comparative Study of Religions*, 1923; Workman, G. C.: *Jesus the Man and Christ the Spirit*, 1928.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That a belief in the supernatural is essential to religion.
2. "The absolute Idea (the Good, the One) is the lord of the spiritual world, as the sun is the lord of the visible world." (Weber.) Is this conception of Deity, ascribed to Plato (427-347 B.C.), more enlightened than the conceptions found in the Homeric poems? Discuss.
3. The prophet Amos, who flourished about the middle of the eighth century B.C., is sometimes regarded as one of the earliest exponents of monotheism. (a) Is he as explicit in this respect as Isaiah, xliii, 10 and xliv, 6? (b) Show that one of the chief characteristics of *The Book of Amos* is a sense of social injustice. (c) Would the prophet's early occupation make him sympathetic with the poor and oppressed?
4. Explain the animistic and the naturalistic theory of the origin of religion, showing to what extent they coincide and to what extent they differ.
5. Discuss the view that social reformers, even when disclaiming all religious faith, share the purposes and ideals of religious reformers.
6. Support or refute the statement that indifference to the progress of science and lack of faith in the purposes of scientists is a culpable form of skepticism.
7. To what extent is it true that woman's religion is of the here and now, rather than of the hereafter? Express yourself freely on this subject, and indicate in general what modifications in religious belief may result from the recent improvement in woman's social status.

XXX

THE FIELD OF KNOWLEDGE

Any synopsis of recent civilization would be incomplete which failed to take account of the classification and the interrelations of the various divisions of the field of knowledge.

This truth was amply recognized by the organizers of the Universal Exposition held at St. Louis in 1904. They foresaw that the sciences, in the broadest sense of the term, would put their impress on every square foot of the World's Fair, the purpose of which was to take stock of the progress of man during the one hundred years that had followed the Louisiana Purchase. They decided, therefore, to call together an international congress of men of thought and action, who would represent the branches of knowledge and the occupations which had contributed so largely to the development of civilization. To this learned assembly, including hundreds of the foremost scholars and experts of Europe and America, was assigned the task of revising the methods, fundamental conceptions, and relationships of all the sciences, of interpreting civilization in general, of considering and advancing the unity of knowledge, and of bringing into correlation and synthesis the theoretical and practical scientific work of the time. At the suggestion of Professor Hugo Münsterberg a classification of the sciences was adopted, which, in spite of its imperfections, will enable us to recapitulate from a new point of view what has been learned in the previous chapters concerning the vocational activities of man and the development of organized knowledge. Here the relationships between the branches of theoretical knowledge on the one hand and the branches of practical knowledge on the other hand are made clear.

A. NORMATIVE SCIENCES

- | | |
|---|--------------------------|
| 1. Philosophical Sciences
(Logic, ethics, esthetics) | 2. Mathematical Sciences |
|---|--------------------------|

B. HISTORICAL SCIENCES

- | | |
|--------------------------|-------------------------|
| 3. Political Sciences | 7. Pedagogical Sciences |
| 4. Legal Sciences | 8. Esthetic Sciences |
| 5. Economic Sciences | 9. Theological Sciences |
| 6. Philological Sciences | |

C. PHYSICAL SCIENCES

- | | |
|-------------------------------|------------------------------|
| 10. General Physical Sciences | 13. Biological Sciences |
| 11. Astronomical Sciences | 14. Anthropological Sciences |
| 12. Geological Sciences | |

D. MENTAL SCIENCES

- | | |
|----------------------------|---------------------------|
| 15. Psychological Sciences | 16. Sociological Sciences |
|----------------------------|---------------------------|

E. UTILITARIAN SCIENCES

- | | |
|---|--|
| 17. Medical Sciences | 19. Technological Sciences
(Engineering, agriculture) |
| 18. Practical Economic Sciences
(Commerce, transportation) | |

F. REGULATIVE SCIENCES

- | | |
|----------------------------------|-------------------------------|
| 20. Practical Political Sciences | 22. Practical Social Sciences |
| 21. Practical Legal Sciences | |

G. CULTURAL SCIENCES

- | | |
|------------------------------------|----------------------------------|
| 23. Practical Educational Sciences | 25. Practical Religious Sciences |
| 24. Practical Esthetic Sciences | |

Only a few of the shortcomings of this classification need be indicated here. (1) The term applied to group A is not distinctive, since grammar, rhetoric, and other branches of knowledge, as implied in an earlier chapter, are normative, or prescriptive. Moreover, it is less generally applicable to esthetics than it is to ethics, logic, and mathematics. (2) The term "historical," applied to group B, tends to place an undue emphasis on one aspect of the sciences composing it. This is apparent when we take note of the subdivisions of the program of the Congress of Arts and Sciences. For example, under the esthetic sciences the history of the fine arts, the history of architecture, and the history of music are the only sections to appear. We need not dwell on the inconsistency of selecting certain sciences for historical treatment while ignoring the historical phases of others, or on the confusion caused by divorcing theology from philosophy and ethics and allying it with economics. (3) The term applied to group C, as will presently be made clear, is somewhat ambiguous. (4) There seems to be no valid reason for excluding from group D logic, ethics, and the other so-called normative sciences; while to separate sociology from political science, economics, and jurisprudence is little short of a blunder. (5) The term "utilitarian," applied to group E, is less appropriately used of the medical sciences than of engineering proper and agriculture. Indeed, Professor Münsterberg acknowledged certain defects in his classification of the practical sciences. (6 and 7) "For instance, education, which aims primarily at self-development, might well be considered also from the point of view of social regulation; and still more naturally could the utilitarian sciences of the economic distribution of the means of support be considered from this point of view." It is no doubt impossible to arrange the various divisions of knowledge in well-concatenated and mutually exclusive groups. Nevertheless, the following plan of classification may afford students an opportunity for comparison and criticism. The author offers it as a basis for further attempts, and trusts that it will be considered as merely suggestive and tentative, or, at least, as by no means definitive.

A THEORETICAL KNOWLEDGE**B PRACTICAL KNOWLEDGE****I (a) Physical Sciences**

1. Astronomy, meteorology
2. Geology, physiography, etc.
3. Geodesy, surveying
4. Physics
5. Chemistry

(1) Technology

Navigation, weather forecasting; mining, metallurgy, irrigation; civil, and railway engineering; mechanical, electrical, and chemical engineering, glass-making, dyeing, domestic science, etc.

(b) Biological Sciences

6. Biology, genetics
7. Botany, bacteriology
8. Zoölogy, parasitology
9. Anthropology, anatomy, physiology, pathology, neurology, etc.

Agriculture (plant and animal husbandry), eugenics, hygiene and sanitation, preventive medicine, therapeutics, surgery, psychiatry, etc.

II Philosophical Studies

10. Philosophy
11. Ethics, religion
12. Esthetics
13. Psychology, logic, mathematics
14. Pedagogy

(2) Cultural Activities

(Applications under 11, 12, etc.)
Morals, church organization, etc.
Architecture, music, acting, etc.
Research, vocational selection; methods of instruction, school management, etc.

III Social Sciences

15. Sociology
16. Political Science
17. Jurisprudence
18. Economics
19. Geography, ethnography
20. Philology
21. History, archeology

(3) Social Direction

Treatment of poverty, vice, etc.
Government — municipal, etc.
Administration of the law.
Banking, transportation, commerce, control of immigration.

Language and literature, etc.
Guidance of the development of society by racial experience.

A. Philosophy, or the science of sciences, submits to critical examination conceptions common to the various branches of knowledge. What is a scientific law? What is the inner relation of cause and effect? What is the essence of reality? Is it matter, energy, or mind? From the results of the special sciences and by means of the scientific method, philosophy seeks to develop a consistent theory of the universe, to gain a comprehensive view of man's physical and social environment, to discover the ultimate explanation of phenomena, and to appreciate the end or purpose of the evolutionary process. In face of the continuous specialization required by the growth of the sciences, it aims to reconstruct the wholeness of life by relating the sciences in the unity of knowledge. It undertakes the task of classification. To the labors of Bacon, Locke, Kant, Hegel, Comte, and other philosophers, science is indebted for attempts to survey the field of knowledge and for invaluable suggestions as to its more effective cultivation. Logic, as taken for granted in the chapters on scientific method, is the normative aspect of the psychology of the intellectual processes. Mathematics, the model and ally of the exact sciences, making use of the clearest possible concepts and drawing conclusions from valid premises, may be considered a part of inductive-deductive logic. Ethics is the science of moral right and wrong. It influences the development of jurisprudence; it dictates, as we have seen in an earlier chapter, the aims of education; it is akin to true religion; it dominates our ideals of human character and our plans for social and political amelioration; in the economic struggle it is the real arbiter, whose decisions must eventually prevail; it is the touchstone of a progressive civilization. The ethical spirit, as we have already in part recognized, pervades the literature and ennobles the art of all times. Esthetics is inadequately described as the science of the beautiful. It deals with the emotional appreciation of scenery and natural objects (the sublime, the desolate, and the fantastic, no less than the beautiful, the graceful, and the delicate), with taste in art, and with the functioning of the creative artistic imagination. Since the beauty of the mind, as Plato says in

the *Symposium*, is no less honorable than the beauty of the outward form, it is not surprising to find that some writers refer to the beauty of a scientific theory or demonstration, consider the ethical as an aspect of the esthetic, or speak of social intercourse as a possible division of fine art.

B. The historical sciences, so-called, are concerned with the study of municipal, national, and other kinds of government, with the growth of law, the production and distribution of wealth, the development of language and literature, the principles and purposes of education, the theory of the fine arts, and other social problems broached in the preceding chapters. The opinion that history is merely past politics has long since been abandoned. It has become the practice of historians, even of the most conservative, to supplement their accounts of political history by fragments at least of the history of law, economics, letters, education, art, and religion. Leaders in the study of history have applied the genetic method to the examination of their own specialty and, supported by the history of history, declare that history from the political and national point of view — almost inevitably propagandist in its tendency — must yield place to history from a cultural and humanitarian point of view. Indeed, an analysis of contemporary civilization would seem to be a rational preliminary to further advance in the development of the study of history; for not only does a knowledge of the past aid in the interpretation of the present, but the present — concerning which our information is comparatively full and reliable — affords us a clue to the past, and places in our hands, let us hope, some means of anticipating the future. Parallel with the growth of interest in the ancestry of mankind, partly owing to the discoveries of anthropology and general archeology, there can be traced a steadily increasing solicitude for posterity. We endeavor to read the destiny of mankind, with its untold potentialities, by such light as the study of cultural development furnishes. Our sense of human solidarity, in fact, has become extended through space as well as through time. Just as we have become conscious that our present civilization is the

outcome of past civilizations and that whatever we achieve today will affect the welfare of all succeeding generations, so (through the improvement of the means of communication) we have become fully aware of our relations to remote peoples, who may be elevated by our ideals or led to sit in judgment on our manners and customs.

C. Certain branches of knowledge that deal with the phenomena of the material world — such as astronomy, physics, chemistry, and geology — in conjunction with mathematics and certain branches of knowledge that deal with the phenomena of the organic world — such as botany, zoölogy, and anatomy — seem to have acquired among English-speaking peoples a claim to special respect. For us these are the sciences *par excellence*. Among the Germans the study of ethics, economics, history, or literature, is considered science (*Wissenschaft*); and among the French a scientist (*savant*) is simply one who knows. But with us the physical and biological sciences and mathematics have had a definitely acknowledged preëminence, and their exponents alone have ranked as real scientists. On account of the place they hold among all the branches of learning these sciences in particular have, we find, incurred the hostility of people who resent the authority of demonstrable truth. It is, therefore, unfortunate that the terms under which they are classed are not free from obscurity. The term “physical science” is used at times, as by Münsterberg, to include both the physical sciences proper and the biological sciences. Similarly, the term “natural science” may be made to include both the biological sciences and the physical sciences. Thus the natural sciences (*Naturwissenschaften*) are placed in opposition to the mental sciences (*Geisteswissenschaften*). The old expression “natural philosophy” is another stumbling-block, for it was applied not to biology and its branches, but to physics, astronomy, and mathematics. It is to the physical and biological sciences, as has been made sufficiently clear in several earlier chapters, that contemporary civilization is indebted for the development of technology and the greater part of our complex system of specialized occupations.

D. Psychology, the science of the mental processes, is closely related to logic and the other philosophical sciences as well as to the physiology of the brain, neurology in general, and other branches of knowledge. It is of great value, as we have seen, in scientific research. It dictates methods of forming habits and of controlling the attention, the memory, and the emotions. It should not be ignored by physicians, teachers, parents, judges, lawyers, clergymen, actors, painters, publicity experts, salesmen, factory managers, etc. It suggests means of imparting mechanical skill, of stimulating initiative, of alleviating the discontent and of counteracting the lack of freedom and spontaneity characteristic of modern industry. An interrelation exists, of course, between psychology and sociology, or the scientific study of society. The social mind is the product of the interaction of the impulses, feelings, and ideas of individual minds. Hardly less obvious are the relations of sociology to political science, jurisprudence, economics, and the other so-called historical sciences.

E. There is no sharp distinction between theoretical and practical knowledge, pure and applied science. The early history of the sciences bears witness to the fact that, in the main, they arose in response to practical needs. Man's scientific curiosity was developed in connection with the daily occupations, in determining seed-time and harvest, in maintaining direction by day and night, and in discovering means to relieve suffering and to cure disease. The attempts to read human fate in the stars, to produce gold from the baser metals, to fix the boundaries of a field, to calculate the cubical contents of a granary, and to measure the height of a pyramid, are typical rather than exceptional occurrences in the early stages of the development of astronomy, chemistry, and mathematics. Among the so-called utilitarian sciences, medicine is based on anatomy, physiology, pathology, bacteriology, parasitology, pharmacology, chemistry, and other branches of natural and physical science. Mental science also finds application in medical practice, because, along with other reasons, there is a close connection between psychology and psychiatry. Under practical

economics Münsterberg includes such vocational activities as banking, transportation, and commerce. Besides the different kinds of engineering (civil, railway, marine, mining, metallurgical, oil and gas, mechanical, chemical, and sanitary), technology comprises multifarious divisions and subdivisions. Let it suffice to mention here (in alphabetical order) aeronautics, agriculture, ceramics, brewing, distilling, dyeing, glass making, horticulture, military and naval science, and printing and publishing.

F. The control and direction of social activities, potent as an underlying determinant in many forms of human endeavor, is, of course, the keynote in practical politics, law, and industrial organization. By reference to the political, legal, and economic life of the past it is not difficult to trace tendencies which have now become almost irresistible. For example, recent decades have witnessed the last throes of absolutism. Liberalism is being challenged by radicalism, and it can no longer be maintained that the best government is that which governs least. In national legislation a new emphasis is laid on the equality of women, education, sanitation, child labor, the regulation of wages, employers' liability, the improvement of transportation and communication, the carrying through of irrigation and power projects, the nationalization of public utilities, and other democratic if not socialistic measures. A similar change has come over municipal government (as we have seen in the fourteenth chapter) and, likewise, over colonial government. Experts in colonial administration heartily condemn the old practice of exploiting the less highly developed peoples; they realize that the possession of colonies involves the acceptance of heavy responsibilities, and that in the treatment of aborigines the general ends and purposes of civilization must not be disregarded. Patriotic sentiment is undergoing modification under the influence of a growing international political consciousness. We have already discussed recent efforts to develop and apply a code of international laws, and to remove in private law the barriers between the legal and the ethical. To establish the reign of ethico-legal principles in the production and distribution of the

necessaries of life is the professed aim of all those reformers who are interested in economic and industrial organization.

G. Finally, there is no real culture without purpose. The essence of education, the first of the cultural sciences, lies in the pursuit of certain ethical aims, in the formation of character through action, through the exercise of the will in conformity with the present or future organization of society. The protest of Browning at Wordsworth's defection, as it seemed to him, from the cause of liberty is only one of many indications that social purpose is not foreign in the realm of art. Only those interested in the general welfare can appreciate the rugged enthusiasm of the lines:

Shakespeare was of us, Milton was for
us,
Burns, Shelley, were with us, —
they watch from their graves!
He alone breaks from the van and
the freemen,
He alone sinks to the rear and the
slaves!

We shall march prospering, — not
through his presence;
Songs may inspirit us, — not from
his lyre;
Deeds will be done, — while he boasts
his quiescence,
Still bidding crouch whom the rest
bade aspire.

Morris, Ruskin, Tolstoy bear like testimony. Matthew Arnold derides the optimistic sophistries of complacent scholars who ignore

the armies of the homeless and unfed, and gives ardent expression to the need of leadership and direction:

Strengthen the wavering line,
Stablish, continue our march,
On, to the bound of the waste,
On, to the city of God.

As in education and art, so, likewise, in religion; the sum and substance of our faith depends on the will to advance.

REFERENCES — Flint, R.: *Philosophy as Scientia Scientiarum*, 1904; Münsterberg, H.: "The Scientific Plan of the Congress," *Congress of Arts and Sciences*, vol. I, 1905; Ogburn, W. F. and Goldenweiser, Alexander: *The Social Sciences*, 1927; Patrick, G. T. W.: *The World and its Meaning*, 1925; Randall, J. H.: *The Making of the Modern Mind*, 1926; Thomson, J. A.: *Introduction to Science*, 1911; Wallace, W. K.: *The Trend of History*, 1922; White, W. Alanson: *The Meaning of Disease* (chapter ii, "Science"), 1926; Whitehead, A. N.: *Science and the Modern World*, 1925. See also the Table of Contents of the Classified Index of the *Encyclopedia Americana*, 1925.

Questions, Suggestions for independent study, and Topics for discussion or debate:

1. Resolved: That there is no true culture without purpose.
2. Should the term "science" be used to designate the physical and natural sciences and mathematics exclusively? Discuss.
3. Show that all the leading vocational activities are based on organized or scientific knowledge.
4. To what extent has each of the following been dealt with in the preceding chapters: sociology, political science, jurisprudence, economics, geography, ethnography, philology, history, and archeology?
5. Discuss the view that an analysis of contemporary civilization is a rational preliminary to further advance in the development of the study of history.
6. Write an essay of three or four thousand words on "Military and Naval Science."

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